Lafayette Clean Energy Center

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Final Capstone Report

EGRS 451

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Lafayette Clean Energy Center

LAFAYETTE COLLEGE

Table of Contents

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Intro

As human-made pollution grows and climate change accelerates, the push to implement more sustainable forms of energy production has been at the forefront of political, economic, and social discussions. According to the United States office of Energy Efficiency and Renewable Energy, solar energy production currently accounts for only 3 percent of US energy production.[1]

Although solar energy is not yet a primary source of energy across the United States, the technology has existed and been advancing over the course of the last 50 years. The first patents for a solar powered engine, similar to the technology we have today, was issued to French mathematician Augustin Mochot in the 1860s.[2] The first solar cell was then constructed by New York inventor Charles Fritts roughly 20 years later in 1884 (See Figure 1). The original solar panels that were constructed had an energy conversion of roughly 1 to 2 percent, today modern solar technology has advanced to achieve an energy conversion rate of roughly 20 percent.[3]

Modern solar panels exist in two forms, thermal panels (CPT) and photovoltaic (PV) panels. Thermal panels (See Figure 2) are used usually for "water heating, the panels on your roof are the collectors of sunlight, thus heating up the liquid in the tubes which is then transported into your cylinder ready for use."[4] PV panels (See Figure 3), which are a newer technology than thermal panels absorb sunlight and transform it into

[1] Solar Energy in the United States. (n.d.). Retrieved from https://www.energy.gov/eere/solar/solar-energy-united-states
[2]Magazine, S. (n.d.). A Brief History of Solar Panels. Retrieved from https://www.smithsonianmag.com/sponsored/brief-history-solar-panels-180972006/
[3] Ibid
[4] How Does Solar Work? (n.d.). Retrieved from https://www.energy.gov/eere/solar/how-does-solar-work#cspbasics

electricity by utilizing a silicon based technology. While the cost of installing PV panels is typically higher initially[5] they have become the more popular option for colder environments as they are less likely to freeze and more efficient in the winter than thermal panels.

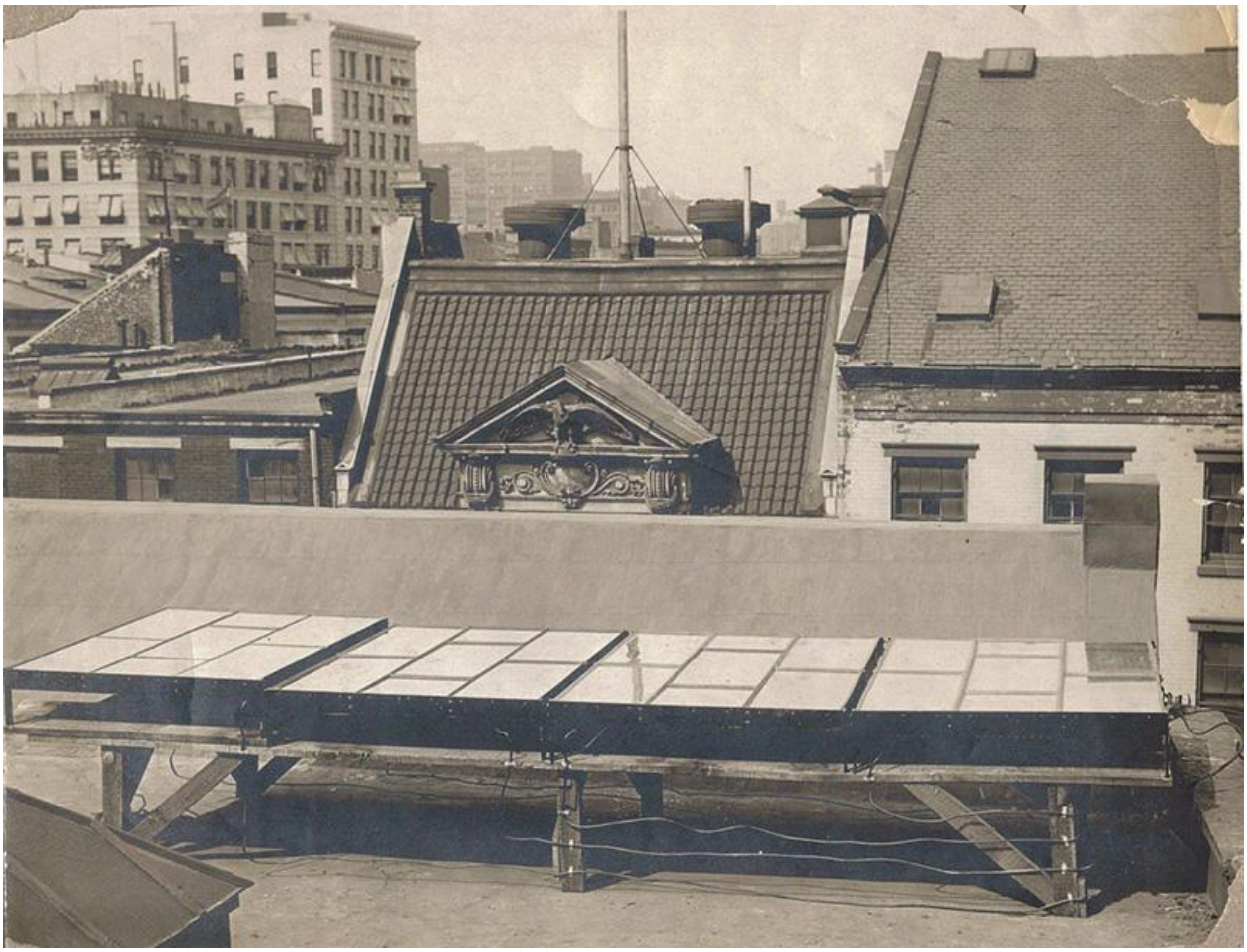

Figure 1: The First Rooftop Solar Panel Installation in 1884

[5] Solar Panels vs Solar Thermal Technology (2021). (n.d.). Retrieved from https://www.greenmatch.co.uk/blog/2015/04/solar-panels-vs-solar-thermal

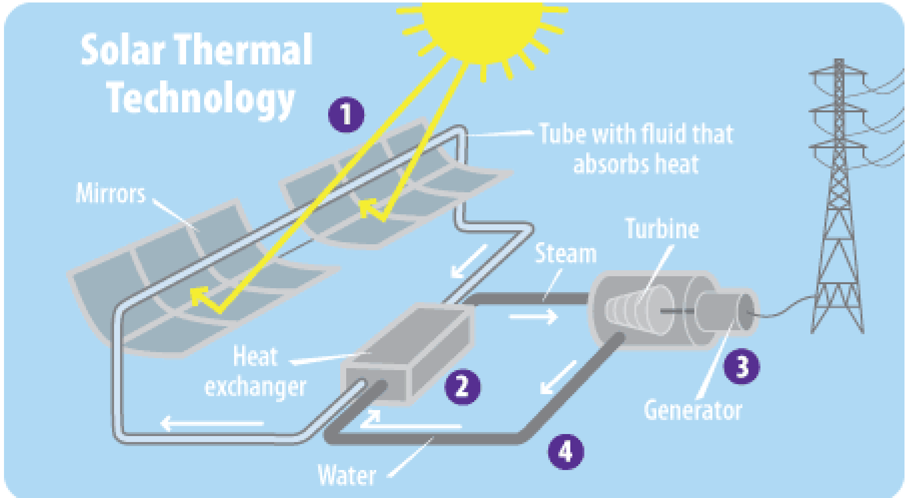

Figure 2: Thermal Solar Panel

Figure 3: Photovoltaic Solar Panel

Over the previous summer Lafayette College began "installation of solar panels on the sun-soaked roof of Kirby Sports Center."[6] Consisting of an array of rooftop photovoltaic panels, this project is part of a larger initiative by the college to reach carbon neutrality by the year 2035 as detailed in the "Climate Action Plan". According to the

[6] Kirby Sports Center Solar Installation. (n.d.). Retrieved from https://sustainability.lafayette.edu/2021/05/28/kirby-sports-center-solar-installation/

Lafayette Sustainability Office, “the approximately 470-kilowatt (kW) solar array will power operations at Kirby. The solar installation is expected to generate around 540 megawatt-hours (MWh) of clean, renewable energy annually. Over its lifetime, the solar array will offset 9,625 metric tons of carbon dioxide (CO 2), or the equivalent of taking more than 2,000 cars off the road.”[7] In addition to providing power to the Kirby Sports Center and the surrounding power grid, the college also aims to use the solar array as an opportunity to “provide experiential learning opportunities for students.” In attaining this goal, Lafayette hopes to have faculty “integrate the project into courses, providing students a deeper understanding and a real-world example of solar at work.”[8]

Figure 4: Photo of the recently completed Kirby Solar Array[9]

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[7] Ibid

[8] On-Campus Solar Installation Begins. (2021, June 15). Retrieved from https://news.lafayette.edu/2021/06/16/on-campus-solar-installation-begins/

[9] Drone photography taken by Matthew Bahr

Although the construction of the solar array is a strong step in the right direction for the College to become more sustainable, the goals of creating curricular tie-ins around solar energy and using the solar array to serve as a model to the community on sustainability have not been clearly outlined. Given the wide range of possibilities surrounding the solar array, our group has set out to clearly define a plan for the solar array to be integrated into the Lafayette curriculum as well as be a teaching tool for students in the surrounding Easton community. In order to gain the best perspective on possibilities for the solar array our group examined the types of solar projects that exist on other college campuses and how these solar projects have been integrated into curriculum at their respective institutions.

The college has plans to integrate the array into the curriculum but there are also other initiatives that can be taken in addition to curricular integration to help maximize the value the array brings to the college. After researching other peer institutions through various case studies, there are many key aspects of clean energy involvement on campus that we can replicate here at Lafayette. Lafayette has taken considerable steps to advance the sustainability sector at the college by involving sustainable environmental practices and advancing our energy efforts, but there is still more that can be done to involve solar to make Lafayette a greener campus. While the solar array is undoubtedly a positive step towards Lafayette's goals of becoming carbon neutral by 2035 and also increasing the sustainability of the college, this can also be seen as a first step in making sustainability a focal point on campus. If the array is integrated and utilized into coursework as the college aims to, the Kirby solar array can be built upon in order to fund future sustainable projects where students can continue to gain hands-on learning experiences in the field of sustainability. In order to further involve the Kirby Solar Array within the campus, we propose to create a center on campus to revolve around all aspects of clean energy on campus and within the surrounding community. In order to continue this growth and advance the campus, we are proposing the creation and establishment of the Lafayette Clean Energy Center (LCEC). Involving this faculty led, student driven organization on campus would not only involve students directly with renewable energies like the Kirby Array, but would provide a space on campus to involve all academic disciplines and deeply engage the community in regards to clean energy.

In order to gain the maximum potential from the LCEC our group proposed developing an existing space in the Rockwell Integrated Science Center, adjacent to the current location for the Office of Sustainability as well as developing a Microgrid laboratory in the Kirby Sports Center. The reasoning for the first location, adjacent to the Office of Sustainability was primarily proposed to allow for the new staff working at the LCEC to have easy access to collaboration with the Office of Sustainability. For the microgrid laboratory our group's goal was to allow for students easy access to the solar array. Having a location in the sports center, the same building that houses the array will allow for maximum hands-on opportunities with the solar panels as curricular tie-ins for multiple departments.

In addition to the physical developments associated with the LCEC, our group aims to have this space be a community resource for both Lafayette Students and the surrounding area. With the momentum of the solar array and the LCEC we believe we can implement community programs similar to what has been done at other schools that we examined in the case studies and technical portions of analysis. Our hope is that these developments will continue to strive for future sustainable efforts on campus and place Lafayette at the forefront of Institutions driving sustainable development.

Case Studies

In order to understand the ways we could involve the Kirby Solar Array within our Lafayette campus, we wanted to do further research on the ways solar energy affects general college campuses. To do this, we looked at multiple cases from different universities within the United States, and wanted to see how solar arrays and energy was involved within the community, curriculum, and policies of these schools. Lafayette College is inherently unique, and getting a better understanding of the current state of renewable energies on college campuses has helped us narrow down our plan to involve the Kirby Array further within our campus.

Many of the schools we looked at had highly ranked solar and renewable energy programs, as we wanted to get a broader understanding of how different schools work within the field. One of the universities that we looked at was the North Carolina State University, which has been a leading university relative to clean energy involvement and education. For the past 30 years, North Carolina State has involved students and the community within their clean energy efforts by implementing the N.C. Clean Energy Technology Center (See Figure 5). This center for renewable energies involves itself with partners from all different fields in order to teach its students a broader understanding of clean energy technologies. The Clean Energy Technology Center is acknowledged as a largely prominent center for clean energy education, and focuses its work around 7 categories: Renewable Energy, Clean Power & Industrial Efficiency, Clean Transportation, Training, Policy, Center Projects, and Energy & Sustainability Services.[10]

Figure 5: The NCSU Solar House, built by North Carolina Clean Energy and Technology Center at North Carolina State University. Used for demonstration, education, and research.

The NCCETC provides students with in person involvement with renewable energies, policy research and analysis, sustainability, and high level in-field training. The Center involves students directly within a technical setting to be able to demonstrate and

[10] Advancing a Clean Energy Economy. (2021, May 10). Retrieved from https://nccleantech.ncsu.edu/

educate students on clean energy technologies, practices, and policies. NCSU also holds many different solar energy projects, including a 16 foot large solar "tree", which accumulates an output of around 2,114 kWh of electricity in one year.[11] In addition, the Center also provides leading research in solar energy, and is a massive resource for students and the public regarding governmental policies and incentives for clean energy. The NCCETC operates the Database of State Incentives for Renewables & Efficiency (DSIRE), which is "the most comprehensive source of information on incentives and policies that support renewables and energy efficiency at the federal, state, local, and utility levels."[12] The NCCETC provides large environmental and educational benefits to students at NCSU, and being open to students from any discipline the Center allows for deeper clean energy involvement within the curriculum, as well as offers internship opportunities, pushing it to be a leader in higher environmental education.[13]

Additionally, the NCCETC also provides support towards the sustainable energy economy throughout North Carolina by partnering with solar companies and creating shared solar projects. For example, the NCCETC created the Community Solar for the Southeast project. This project makes solar more affordable and accessible through shared solar projects developed by cooperative and municipal utilities across the Southeast[14]. For this specific project, the Center partnered with multiple solar and utility

[11]Centennial Campus Solar Structure: NC State University. (2017, June 30). Retrieved from https://sustainability.ncsu.edu/campus/energy-water/solar-energy/centennial-campus-solar-tree/
[12]DSIRE: Database of State Incentives for Renewables & Efficiency. (2020, March 11). Retrieved from https://nccleantech.ncsu.edu/renewable-energy-resources/dsire/
[13] FAQs. (2021, October 07). Retrieved from https://nccleantech.ncsu.edu/faqs/#
[14] Office of Energy Efficiency and Renewable Energy. (n.d.). *Project profile: North Carolina Clean Energy Technology Center (SEEDS2-SES)*. Energy.gov. Retrieved December 11, 2021, from https://www.energy.gov/eere/solar/project-profile-north-carolina-clean-energy-technology-center-seeds2-ses

stakeholders to determine solutions needed to increase development of community solar projects in the Southeast. This helps the project fully provide technical assistance to utilities across the Southeast in order to help them analyze, design, and implement community based solar projects. The project was awarded a million dollars from the SunShot initiatives, a solar energy based government program to incentivize and promote solar adoption. This resulted in the project adding an additional 200 megawatts or more of community solar projects in the Southeast, which is a massive change from the 1 megawatt output that currently exists. The project also entails the publishing of a guide to implementing community based solar projects, which will provide a framework for all utilities in the region that are not touched by this project to also increase shared solar projects. The NCCETC thoroughly involves itself within its community and aims to not only be a resource for the school, but also provide renewable energy services, education, and support to the surrounding area. North Carolina State's Center stands as a great example of how renewable energies can involve themselves with a university and its community, and there is a lot we can learn from from their programs.

Another school with promising developments around their solar energy program is Drexel University. With Drexel located in close proximity to campus, this peer school can serve as an example as to how Lafayette can involve the community with solar array. Drexel committed in 2010 to have "100 percent clean renewable wind and solar energy."[15] This commitment was funded through the purchasing of Renewable Energy Certificates or RECs which "are a market-based instrument that certifies the bearer owns

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[15]Drexel University Commits to 100 Percent Clean Renewable Wind Energy. (2010, October 07). Retrieved from https://drexel.edu/now/archive/2010/October/Drexel-University-Commits-to-100-Percent-Clean-Renewable-Wind-Energy/

one megawatt-hour (MWh) of electricity generated from a renewable energy resource. Once the power provider has fed the energy into the grid, the REC received can then be sold on the open market as an energy commodity."[16] Through these renewable energy credits Drexel not only expanded their solar energy production but also generated community and student body initiatives around their new solar energy production.

One development that came from this was increased funding towards solar research in which undergraduate and graduate students worked on solar power research projects. Some of the recent developments of this research has been students working on the development of thin film solar cells[17] as well as research on various dyes that can be used to help solar panels become more efficient.[18] Aside from research the school has also promoted a new minor in green energy and sustainability. In this coursework students can take courses such as solar energy engineering, energy conversion, as well as renewable energy systems.[19] Through this program and other integrated renewable energy coursework on campus students are able to study and work with the solar panels that have been constructed.

In addition to the increased student involvement around solar energy, the college also offers community initiatives that allow for renewable energy centered interactions

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[16] Chen, J. (2021, July 05). Renewable Energy Certificate (REC). Retrieved from https://www.investopedia.com/terms/r/rec.asp

[17] Drexel University Commits to 100 Percent Clean Renewable Wind Energy. (2010, October 07). Retrieved from https://drexel.edu/now/archive/2010/October/Drexel-University-Commits-to-100-Percent-Clean-Renewable-Wind-Energy/

[18] Dye-sensitized solar panel research. (2012, August 28). Retrieved from https://drexel.edu/now/archive/2012/August/Dye-sensitized-solar-panel-research/

[19] Minor in Green Energy and Sustainability. (n.d.). Retrieved from http://catalog.drexel.edu/undergraduate/collegeofengineering/greenenergyandsustainabilityminor/index.html

between the University and the surrounding community. One of the oldest initiatives Drexel has is the Junior Solar Sprint (See Figure 6). The event, in which Drexel partners with Philadelphia Solar Energy Association to put on, consists of students from 5th through 8th grade coming to the campus to compete in a competition to see who can design the best solar powered car. While the event is designed to "develop students hands-on experience in science, technology engineering, and math"[20] It also exposes them to the possibilities of designing using sustainable technology, something that is often overlooked in domestic science education.

Figure 6: Drexel University "Solar Sprint" Competition

Along with the development of programs for local youth, Drexel has also set out to make the cost of solar installations more affordable for local families. According to their plan, Drexel "works with a solar company to provide free energy usage assessments

[20] No Sun? No Worries – the Solar Sprint Goes On. (n.d.). Retrieved from https://drexel.edu/engineering/news-events/news/archive/2018/May/solar-sprint-goes-on/

on community members' homes. After the assessment, Drexel provides discounts and rebates to these homeowners, helping them to reduce the cost of solar array installation."[21] Through this initiative Drexel is not only making solar power more accessible but also strengthening its ties with its communities.

One of the largest adopters of solar power amongst universities in the U.S. is Arizona State University. As of June 2021 they had a combined on-site solar power output of 24.2 MW, and a total output of 53 MW. With a carbon offset of over 42,000 metric tons[22]ASU has shown their continued commitment to their investment in large scale solar arrays across their campus. In support of their continued efforts, ASU cites a multitude of practical benefits from their solar arrays. Aside from the obvious electricity generation their arrays provide nearly 6,000 shaded parking spaces, reduced building heat-load, and extended lifetime for roofs that have solar arrays installed (Figure 7).

These are common benefits to the adoption of solar power on college campuses. However, like many other Universities, ASU has embraced the various educational and community engagement benefits that can come from their solar arrays as well. They have used their arrays to build living-learning laboratories to provide lab experience for students at the Julie Ann Wrigley School of Sustainability. And by providing access to some of their solar arrays they have been able to construct a solar lab and deck that gives students the opportunity to research solar energy uses, new PV modules, and new solar energy technology. The classroom and lab opportunities have allowed ASU to become a leading institution in Solar Energy Technology research, development, and training. They

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[21]Staff, B. S. (2019, August 22). Top 10 US Solar-Powered Universities. Retrieved from https://www.solarpowerauthority.com/top-10-u-s-solar-powered-universities-and-how-theyre-doing-it/
[22]ASU Solar. (n.d.). Retrieved from https://cfo.asu.edu/solar

have since introduced a Solar Energy and Commercialization graduate program which has allowed ASU to create strong industry connections and create a groundbreaking interdisciplinary solar education program and made them an industry leader in solar education.

ASU didn't stop there, they even utilized their solar energy prowess to create charity programs. ASU's SolarSPELL program uses solar power digital libraries to help bring teaching tools and basic literacy skills to underserved communities around the world[23]. Not only does this give ASU the chance to use their solar power capabilities to give back, but it can help to improve global views of solar energy and provide even more learning and teaching opportunities to students, volunteers, and faculty. This type of community engagement is an important part of using solar energy to improve its public appearance and increase adoption. ASU first began their implementation of solar arrays on campus in 2004, and at Lafayette we can use their extensive experience to help inspire and develop our own education and community engagement opportunities with the Kirby solar array right here in Easton.

[23] Solar Powered Educational Learning Library. (n.d.). Retrieved from https://solarspell.org/

Figure 7: Solar Parking Structure at Arizona State University

Social Context

As the global awareness of the harmful effects of energy sources such as fossil fuels has grown, there has been a recent push for more sustainable energy development. Although solar energy has been seen to be a viable alternative towards traditional power generation methods, the implementation of solar energy has not yet met the demand. While energy sources are very obviously a climate issue, the environmental pollution they cause is also a public health issue. According to the World Health Organization estimates “roughly 2.5 million people die each year from exposure to combustion products of solid household fuels."[24] These figures also conclude that contamination from air pollution can contribute up to 7% of the global burden of disease.[25]

Unlike fossil fuels, solar energy does not cause any air pollution, carbondiocide, and has a minimal effect on the environment.[26] Another major benefit to solar energy is the long term availability of energy, while fossil fuels are depleting across the world, solar energy will always exist as long as the sun shines.[27] With this taken into consideration it is clear that solar energy has many long term benefits that do not exist with traditional energy sources. However, there is still a social barrier to widespread implementation of solar energy. As scientist Martin Pasqualetti notes when examining the barriers to widespread renewable energy implementation, "they are locally available, sustainable, have low to zero emissions, and in the case of solar and wind energy - do not need to be cooled with water."[28] As the author continues to examine, there are many possible explanations as to why renewable energy hasn't been more readily adopted across the globe, but the primary factor is a lack of understanding of renewable energy from the general public and sweeping generalizations that renewable energy is not cost effective or efficient. In addition to this misconception, some researchers have also pointed to a false societal confidence in "an endless supply of energy"[29] existing. However, with environmental degradation continuing at an unsustainable pace it is clear

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[24] McMichael, A. J., & Smith, K. R. (1999). Seeking a Global Perspective on Air Pollution and Health. *Epidemiology*, *10*(1), 1–4. http://www.jstor.org/stable/3702173
[25] Ibid
[26]U.S. Energy Information Administration - EIA - Independent Statistics and Analysis. (n.d.). Retrieved from https://www.eia.gov/energyexplained/solar/
[27] Ibid
[28] PASQUALETTI, M. J. (2011). SOCIAL BARRIERS TO RENEWABLE ENERGY LANDSCAPES. *Geographical Review*, *101*(2), 201–223. http://www.jstor.org/stable/41303623
[29] Strum, H., & Strum, F. (1983). American Solar Energy Policy, 1952–1982. *Environmental Review, 7*(2), 135-154. doi:10.2307/3984497

that colleges and Universities must lead by example in order to change these false societal beliefs.

On Campus Context

As scientists have studied the importance of sustainability and sustainable development in recent years more colleges have been pushing sustainable development projects, not only to help reduce their footprint but also to elevate their public image in the surrounding community. This has clearly become a worldwide problem as some researchers have described the human impact on the environment similar to the environment having a heart attack.[30] As one anthropologist Peggy Barlet notes, Colleges and Universities have been left to pave the way for new sustainable developments. Bartlet says, "higher education contributes to cultural change toward sustainability through curriculum, research, operations, and community outreach. Universities are now creating sustainability and environmental research centers, and more formal curriculum changes in graduation requirements, certificates, minors, and majors are emerging across the country."[31]

With Lafayette being a leading institution in multiple academic spheres, we intend to uphold this perception on campus and in the surrounding community in terms of sustainable development with the creation of the Lafayette Clean Energy Center. As a liberal arts institution, Lafayette prides itself on social progress through community

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[30] Smith, G. (2010). Teaching about Sustainability. *Teacher Education Quarterly*, *37*(4), 47–54. http://www.jstor.org/stable/23479458

[31] Barlett, P. F. (2008). Reason and Reenchantment in Cultural Change: Sustainability in Higher Education. *Current Anthropology*, *49*(6), 1077–1098. https://doi.org/10.1086/592435

involvement, with many opportunities on campus to pursue change. With a large number of clubs and organizations on campus, students are able to actively participate within their community and work toward achieving the best interests of both groups.

Many departments on campus, such as the Lafayette Office of Sustainability, involve students within paid positions on campus to work towards a shared goal on campus. Organizations like these group together to better campus and serve the community. Implementing a renewable energy focused center or department on campus would not only provide educational opportunities for students, but also provides an opportunity for students to work and collaborate towards clean energy within the community. Involving students outside of classes on their own time creates a very beneficial environment, where students can interact with aspects of the solar array and other energy related topics. Also, the implementation of such a renewable energy center would also allow for more collaboration between other organizations on campus. Many other groups on campus involve similar ideals and interests, and involving a clean energy center on campus would support existing organizations, such as the Sustainability Office or LaFarm. The Kirby Solar Array provides a topic and location for community engagement within sustainability and renewable energy.

Implementing a solar energy involved community on campus can also impact local communities within the area. Ideally, a proposed clean energy center would be a fairly open resource to the public, where locals can involve themselves within renewable energy education and events. In addition, implementing these ideas of solar and renewable energy within surrounding communities can have positive implications for local lower schools. Understanding this can involve these sustainable energies further into lower schools, helping the future understand the importance of renewables.

Community Initiatives

In addition to the increased student involvement around solar energy, our group also proposed developing community initiatives that can be run out of the LCEC such as other peer institutions have done. One of these institutions, Drexel University offers community initiatives that allow for renewable energy centered interactions between the University and the surrounding community. One of the oldest initiatives Drexel has is the Junior Solar Sprint. The event, in which Drexel partners with Philadelphia Solar Energy Association to put on, consists of students from 5th through 8th grade coming to the campus to compete in a competition to see who can design the best solar powered car. While the event is designed to "develop students hands-on experience in science, technology engineering, and math"[32] It also exposes them to the possibilities of designing using sustainable technology, something that is often overlooked in domestic science education.

We would use the momentum of the new LCEC and the associated staff to hold a similar event with students from local Easton elementary and middle schools. We propose hosting this competition in the Kirby Sports Center, giving the college the ability to state that the competition is being hosted in a building entirely powered by the rooftop solar array. Not only does this show the community what is possible with solar energy,

[32] No Sun? No Worries – the Solar Sprint Goes On. (n.d.). Retrieved from https://drexel.edu/engineering/news-events/news/archive/2018/May/solar-sprint-goes-on/

but it also gives community members insights into some of the college's recent development projects. In a piece published for the Institute for Global Environmental strategy noted, “Enhanced quality education of youth is necessary for further progress across all dimensions of sustainable development.”[33] We anticipate this program not only allowing youth to be reinspired to look at the benefits of sustainable energy but also as a great public relations opportunity for the college to bring community members on campus and strengthen the bond between Lafayette and Easton.

Along with the development of programs for local youth, another example of a program Drexel is currently running is making home solar installations more accessible with the surrounding community. Drexel accomplished this goal by “working with a solar company to provide free energy usage assessments on community members’ homes. After the assessment, Drexel provides discounts and rebates to these homeowners, helping them to reduce the cost of solar array installation.”[34] Through this initiative Drexel is not only making solar power more accessible but also strengthening its ties with its communities. We consider this plan to be very feasible in the local Easton community and in addition to heightening the sustainability of the surrounding area, Lafayette can once again have positive interactions with community members and continue building that relationship.

In addition to the community benefits of a renewable energy center, having the ability and ambition to strive for these energy goals also has implications within the ideas

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[33] Paul Ofei-Manu, & Didham, R. J. (2014). *Quality Education for Sustainable Development: A priority in achieving sustainability and well-being for all*. Institute for Global Environmental Strategies. http://www.jstor.org/stable/resrep00748

[34] Staff, B. S. (2019, August 22). Top 10 US Solar-Powered Universities. Retrieved from https://www.solarpowerauthority.com/top-10-u-s-solar-powered-universities-and-how-theyre-doing-it/

of Lafayette's public image. Involving these energy based programs at Lafayette represents the students and school's devotion to the environment. These commitments through the construction and operation of the Lafayette Clean Energy Center can serve to combat social barriers to adopting renewable energy technology both locally and on campus.

Policy Context

Lafayette College is home to many students from very diverse backgrounds and interests. It is a place for people to come from all over the world to study, involve themselves, and interact with education and science in a hands-on setting. With 51 different areas of study among four different academic divisions, Lafayette provides a very broad liberal arts education that involves many interdisciplinary programs to give students the freedom to study their personal interests. Currently, there are not many disciplines that are mutually exclusive, and students can combine many different majors and minors to pursue throughout their college career. Many of these disciplines revolve heavily around scientific and engineering topics, which can help build a more informed and successful curriculum. While already developed, the further involvement of interdisciplinary fields of study can drive Lafayette's students to improve or further current issues within our society.

Environmental Policy at Lafayette

In order to understand how to take advantage of the solar array to further Lafayette's energy and sustainability goals, we need to fully understand what those goals are. In 2019, Lafayette College released their Climate Action Plan 2.0, which outlines the college's standards and future plans regarding energy, carbon emissions, and other important environmental aspects. As previously stated, Lafayette proposed carbon neutrality by 2035, which is an ambitious goal that will take a lot of effort to achieve. Although this goal is a large challenge, Lafayette is well-situated to become a recognized leader in campus sustainability among higher education institutions. The unique identity of Lafayette as a small liberal arts college paired with the school's robust engineering programs provides Lafayette College with the resources and strategies to be able to achieve these climate goals. Throughout the report, the Climate Action Plan provides a road map for reaching carbon neutrality within the time frame, putting a large emphasis on the initial steps for implementation. The Climate Action Plan 2.0 was split into three different time-based phases, with the first phase starting with immediate opportunities, the second revolving around recommendations through 2021-2025, and finally the third finishes with recommendations for the final years leading up to 2035. Of the College's total emissions in 2007 and 2017, the emissions associated with purchased electricity and space and hot-water heating were 91 percent and 88 percent respectively[35]. With the notably massive reliance on purchased non-renewable energies, a large portion of the Climate Action Plan revolves around the utilization of renewable energies on campus and how to involve those technologies within Lafayette's energy grid.

Understanding these goals helps us acknowledge the need to involve other cleaner forms of energy on campus. It also provides further reasoning to create a clean energy based initiative on campus, as the Climate Action Plan does not look to utilize quick

[35] Lafayette College Office of Sustainability. (2019). *Climate Action Plan 2.0*. Lafayette College Climate Action Plan. Retrieved from https://sustainability.lafayette.edu/wp-content/uploads/sites/19/2019/02/Lafayette_climate-action-plan.pdf

surface level solutions to achieve its goals. Rather, it relies on long term solutions, such as the LCEC, to allow the college to continue building on its sustainable policy, achieve its goals, while providing learning opportunities for students and the Easton community along the way. Additionally, reaching carbon neutrality should increase organizational efficiency and help to attract, retain, and motivate students and employees. The Climate Action Plan 2.0 acts as a guide for involving these climate conscious values and goals within Lafayette's sustainable efforts as well as involving students and Lafayette's mission statement within the process. The plan embodies the values that we aim to achieve within our proposal, and showcases the educational, environmental, and community based advantages to Engineering Studies and the Lafayette Clean Energy Center. The goals, values, and methodologies within the Climate Action Plan are extremely important to acknowledge within the creation of the LCEC,

Curricular Policy

Environmentalism also plays a large part within these disciplines, spanning from its own major to involving itself in seemingly unrelated policies. From Environmental Science to Engineering Studies to Policy Studies, many disciplines heavily emphasize the value and necessity of sustainability. Renewable energies, environmental ethics, and environmental justice are all largely important topics within Lafayette's engineering and environmental curriculum. The Climate Action Plan 2.0 directly states "as the problem-solvers of the future, [students] must possess the knowledge and skills required to help the communities they are members of be able to adapt to and mitigate climate change. We can best serve this educational need of our students by transforming our campus into a living laboratory for sustainability, a key component of which will be meeting our articulated goal of carbon neutrality.” The involvement of students and curriculars within topics such as renewable energies, climate change, and other environmental factors is a large goal of Lafayette’s climate plan, and there are many ways in which the LCEC could achieve those goals.

While there are many areas of study involved within the curriculum, Lafayette can use the Kirby Solar Array to deepen its educational curriculum by broadening the field and including additional topics of study. The solar array provides a massive opportunity to involve all different fields of study within the array, and use that experience to build upon their own education. In addition to interdisciplinary coursework around the solar array and implementation of the solar array with existing courses, we have also seen through the other Solar Capstone section, “Solar FYS: An array of Energy and Education,” the ways in which the array could also serve as the subject of stand alone coursework for students at Lafayette.

The main influence on the decision to take advantage of the educational aspects of the solar array would be Lafayette college as a whole, involving decisions from both individuals and board members. The college and its employees are also the leaders who mandate the curriculum throughout Lafayette. In order to involve the solar array into the curriculum, processes and policies within the school need to be followed, and it is also important to acknowledge Lafayette’s ability to add courses, open locations, and available staff. Although there are a fair number of hoops to jump through, involving Lafayette college decision makers with the input of new departmental and educational policies to include people on campus within the solar array project would be largely beneficial to Lafayette.

Local Community Policies

Currently, many policies exist around renewable energy in Pennsylvania. While policies have continued to be put into place to promote the use of solar energy, according to a recent study conducted by The Solar Energy Industries Association, solar energy projects in Pennsylvania only account for 0.39% of the state's energy production.[36] With recent projects such as the Keystone Solar Project and large retailers recently shifting towards gaining more of their energy production through solar, the Lafayette Solar array can be a model for residents of the Easton area on the possibilities of solar energy.

The involvement of the solar array as an educational tool does not have to end at the edges of campus. The codes and regulations surrounding energy policy throughout local communities such as Easton, as well as state and federal, are big examples of how the solar array can be used to study non-scientific topics. Energy policy is the way the government addresses energy, encompassing laws, regulations, judicial opinions, incentives and strategic objectives at the federal, regional, state, local and utility levels.[37] These ideas are important to understand in order to further our knowledge of solar energy education. Also, this political field of study can prove to be another interdisciplinary resource, in which humanities or social science students can study and learn about the governmental and political implications of clean energy, and how that can be involved within developing communities. Implementing policies towards a center for educational involvement within the solar array would positively impact Lafayette.

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[36] Pennsylvania Solar. (n.d.). Retrieved from https://www.seia.org/state-solar-policy/pennsylvania-solar
[37] Advancing a Clean Energy Economy. (2021, May 10). Retrieved from https://nccleantech.ncsu.edu/

Technical

To create such an organization on campus, there are many technical aspects that are required by both Lafayette College as well as other organizations within and outside of campus. Creating an organization such as what we aim to create at Lafayette takes a significant amount of planning around a vast number of students and faculty, all of which need to be accounted for. In order to successfully orchestrate the creation of the clean energy center, we have put together a proposal outlining key aspects of the center as well as how we can solve the challenges that arise.

Overall Mission

The overall focus of the Lafayette Clean Energy Center is to establish an organization on campus that can act as the center of renewable energy technology on campus, and provide a learning environment and database for all Lafayette students to involve themselves in clean energy and the environment. To do so, the Lafayette Clean Energy Center will act as the main hub for students and faculty, providing students the opportunity to work more directly in all aspects of this field. The main mission of the Center can be categorized into multiple goals: to coordinate and host renewable energy-related events and programs, to act as a resourceful energy database, and lastly to act as a clean energy laboratory within Lafayette's curriculum. The Clean Energy Center can promote green energy on campus and involve much of the student body within clean energy related events such as solar competitions, as well as bring in students from multiple disciplines to work hands-on within solar energy data and equipment. Another crucial aspect of the Lafayette Clean Energy Center would be the creation and use of the

Kirby Solar Laboratory, a faculty operated classroom for students to participate and learn directly from an active solar array. Involving a broad number of students and courses within the Lab would not only deepen the curriculum at Lafayette, but can also act as a foundation for younger engineering students to develop a passion and interest for clean energy. Lastly, to provide even more resources for Lafayette, the Clean Energy Center would act as a clean energy database for students and faculty to access freely. This can provide students with more information or data relating to solar energy production, credits, and many other important datasets to involve within their studies. The Center's mission is to provide students with the ability, resources, and information needed to involve themselves within renewable energies in order to promote their adoption both on and off campus.

Curricular Involvement

One of the Clean Energy Center's biggest objectives is to involve the Kirby Solar Array and other aspects of renewable energy within the curriculum of Lafayette students. The goal is to involve as many different people, backgrounds, and courses directly within the Center to learn and contribute to the development of clean energy on our campus. To do so, the Center provides the data, laboratory, and faculty for students to deepen their learning in regards to renewable energies. Classes endorsed by the Center can be held within our locations, providing courses of all majors and minors for students to be able to have an excellent learning experience from the Solar Array at Lafayette. This curricular involvement can help promote discussion of the environment and sustainability throughout campus, and involve more people within the sociotechnical aspects of renewable energies.

While the Clean Energy Center looks to involve all students within the field of renewable energy, we aim to put an emphasis on involvement within incoming Engineering Studies students. As a relatively small major that is mainly filled late in a student's academic career, early involvement from first year students within the major would be extremely beneficial to this department. To involve these younger students, we plan on working with another group of Engineering Studies students who are looking to implement a First Year Seminar aimed specifically involving the solar array. Their proposed FYS is aimed at engineering-minded students and can be an amazing opportunity to involve students within a sociotechnical engineering setting while also giving them a greater introduction to renewable energy and sustainability. To involve this specific course, the Clean Energy Center can provide the means to host lectures or events to involve students within the Center, as well as provide deeper learning sources. The Center can get these young students involved within the goals and ideals of the center, while also providing them hands-on experience and knowledge. The Kirby Solar Lab can be an amazing opportunity to show FYS students a non-classroom technical learning environment while simultaneously involving energy related data in their coursework. The establishment of the Clean Energy Center not only benefits the students and campus at Lafayette, but also supports the development and growth of existing majors.

Another advantage of the Clean Energy Center is the ability to provide the array database to students and faculty from any educational department.. Through this development, other science and engineering faculty will have easy access to develop projects and course material around students using the data from the Kirby Solar array. Another potential use for the solar array in coursework could be the development of economic analysis surrounding solar installation in engineering studies courses or economics courses. One particular course that would be easy to integrate the array would be the engineering economics course that is required for engineering studies students in which students can perform various financial analysis on the Kirby array as well as other solar arrays to learn about the cost saving potential of renewable energy systems.

Aside from coursework and student engagement, another benefit of the Kirby Solar array could be the development of community engagement programs to strengthen the relationship between Lafayette College and the Easton community. For a template for this our group chose to look at the Drexel University case study and some of the community initiatives they have already developed. One of the easier initiatives to implement, we believe, would be a solar competition similar to that of the “Junior Solar Sprint” competition that is run by Drexel and the Philadelphia Solar Energy Association. In order to put on a competition such as this it is likely the College would need to partner with local schools as well as a local company or organization to sponsor the event. One advantage Lafayette would have to hosting the event is that it could be run in the Kirby Sports center which the claim could then be made that is “powered entirely by solar energy generated from the solar array on the roof.” This combination of the competition along with the point that can be made to the students about a practical application of solar power will provide a strong exposure to local students on the usefulness of solar energy. In addition to this exposure, the college can also strengthen its ties with the local community and strengthen its public image. Currently, a program is run where students from the Intro to Environmental Engineering class work on a lab activity with students from Cheston and Paxinosa elementary schools. This same framework can likely be applied to this competition and allow for students to interact with the local students building solar powered cars.

Community Support

Aside from being a place for the community to involve themselves with renewable energies and the environment, we envision using the Clean Energy Center as a database and resource center for students and faculty looking to research or work with the Kirby Solar array. We hope to make data and information about the array available at the Clean Energy Center, as well as on the energy center's website. For example, we want to be able to create and make available a database of renewable energy credits or incentive programs offered in the Easton area that can be made available to students, faculty, and the public. This will allow students and faculty to use data from the solar array and from the incentive database for research or other academic purposes. And by making a renewable energy incentive resource available to the Easton community, Lafayette can play an important role in helping to increase solar energy adoption in our local community and increasing the community connection between Lafayette College and the Easton community. Lafayette could provide an invaluable resource to residents in the form of hyper-local economic data for solar arrays, on top of using the college's experience to help guide residents through the complex government incentive programs.

Space

A big challenge that comes to our attention is the topic of space and location. In order to have the Lafayette Clean Energy Center, there needs to be a designated location or office in which the faculty and students can work and involve themselves. The purpose of the Clean Energy Center is to involve people from all over campus within clean energy systems, so a space to house all said activities is crucial to the development of the Center. In order to reduce materials, costs, and labor, we thought it would be best to take advantage of the buildings we already have built on campus to house the Center. Also, in order to have the opportunity for students and faculty to involve themselves hands-on with the Kirby Solar Array, the Clean Energy Center needs the ability to access the Kirby Solar Array directly. Additionally, having a physical space that students and visitors can see is important for increasing visibility of the Kirby Solar array and reinforcing the college's sustainable image.

When deciding on a space for the Clean Energy Center, we wanted students to have both a community centered office as well as a hands-on learning environment. In order to achieve both, our group made the decision to propose the establishment of the Clean Energy Center within Rockwell Integrated Science Center, as well as establishing the Kirby Solar Lab within the Kirby Sports Center. The Clean Energy Center would involve an adequately sized meeting room that would be able to house community meetings, as well as desks for faculty and student interns. Additionally, this is ideally where we would house the main data and resource and center by dedicating a section of the office for computerized research and analysis. RISC is beyond ideal to house the Center, because not only is it a curricularly involved science building, but it also allows for greater involvement and collaboration with the Office of Sustainability which is also located in RISC. The Sustainability Office would have an influential and direct relationship with the Clean Energy Center, and having the main offices be within the same building would be extremely beneficial. This building also houses the Dyer Center for Innovation and Entrepreneurship, which is another organization on campus that could collaborate with the Clean Energy Center. Lastly, RISC is a very popular building on campus, housing many study spaces as well as the EcoCafe. This can bring more foot traffic and student involvement to the Center, which is beneficial due to the interdisciplinary nature of the Center. Having the Clean Energy Center in RISC would provide students and faculty with an ideal working environment, while also incorporating all aspects of community life on campus.

In order to provide deeper, more hands-on involvement within renewable energies, the Lafayette Clean Energy Center would involve the Kirby Solar Lab for further renewable energy education at Lafayette. In order to establish this active learning laboratory, we propose repurposing one of the many rooms in the Kirby Sports Center into a lab where students can directly study aspects of our solar array such as solar outputs and other metrics, as well as perform hands-on projects with the solar panels. This space can be used to apply Lafayette's solar array within multiple different disciplines, introducing more people to renewable energies. Although having multiple locations on campus can be quite complicated, we think that Lafayette can seamlessly integrate both locations based on the size of Lafayette's campus. Pictured in Figure 8 below, Lafayette's campus is easily walkable, making the interactions between the two locations much easier than normal. While supplementing the Clean Energy Center with solar involvement and data, the Kirby Solar Lab can seamlessly provide an amazing opportunity for students of all disciplines to involve their studies within renewable energy technologies.

Figure 8: Map of RISC and Kirby Sports Center

In order to model what we will need for this lab we examined a similar project at the Lehigh University Smart Microgrid and Renewable Technology Lab or SMRT. A subset of the Lehigh Energy Research Center, the Smart Microgrid and Renewable Technology lab allows students to test and study energy output around four different types of substations in a microgrid test bed.[38] A microgrid, most simply put, is "a local energy grid with control capability, which means it can disconnect from the traditional

[38] Smart Microgrid and Renewable Technology (SMRT) Lab. (n.d.). Retrieved from https://icpie.lehigh.edu/research/facilities/smart-microgrid-and-renewable-technology-smrt-lab

grid and operate autonomously."[39] Since the array has already been constructed, students can use similar technologies to those used at the SMRT lab to analyze the energy output of the solar array. In order to construct this lab, the following materials below will be needed (See Figure 9).

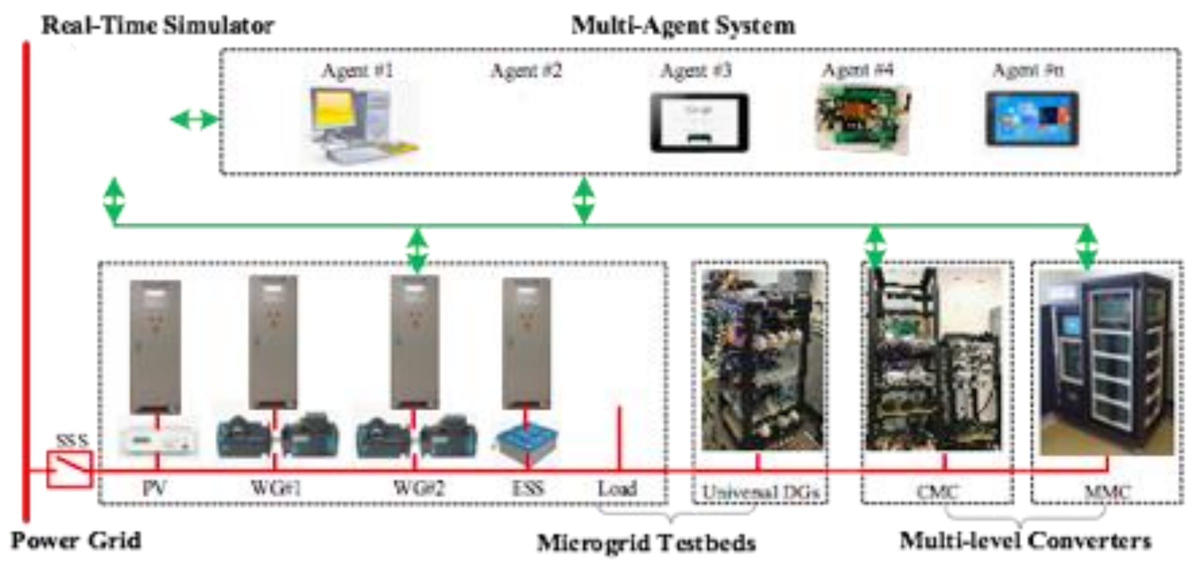

Figure 9: Technological Diagram from the Lehigh SMRT Lab

Faculty

With our designated locations in place, the second technical challenge that we face is interviewing and hiring the potential faculty members who will organize and operate the Clean Energy Center, as well as the Kirby Solar Lab. While the Clean Energy Center will be heavily student involved, more knowledgeable and experienced faculty would be necessary to ensure the success and effectiveness of the Center. Of the faculty

[39] Department of Energy. (June 17, 2014). *How Microgrids Work.* Retrieved from energy.gov: https://energy.gov/articles/how-microgrids-work

positions involved, we propose two new positions within the Lafayette Clean Energy Center. First, we propose a Clean Energy Center Executive Director, who will lead and facilitate all overarching operations within the Center. This position is the most important within the Center, and would supervise and manage all events and processes held by the Clean Energy Center. This involves many activities from a range of energy related disciplines, whether technical energy applications or community involvement. Since this is such a crucial and intricate position, some of the criteria we propose involve significant experience within the energy or renewable energy fields, as well as being dedicated, passionate, and highly involved with students. It would be this position's responsibility to ensure the school gets the most benefit from the LCEC, and that it's resources are available to as many community members as possible.

The second position we would like to propose would be the Clean Energy Center Lab Manager. This position would mainly be responsible for the Kirby Solar Lab and all activities associated within. This position would be less involved within the Clean Energy Center programs themselves, but would have a significant responsibility within the living laboratory aspects of the Center. This involves the maintenance and upkeep of the Solar Lab and the materials within, ensuring that all technologies and processes run smoothly. While this position requires a similar amount of experience within the renewable energy field as the Director, a larger focus on technical or laboratory work related to clean energy would be highly critical. This position needs to understand the whole workings of solar technologies, as well as being able to illustrate those processes to a wide range of students. Because this lab is mainly student based, this position involves the oversight of students from all disciplines, as well as working collaboratively with other professors to help connect their students' curriculum to the solar array. Lastly, this position helps bridge the gap between the two locations involved, and ensure the solar information and energy programs are being relayed effectively.

Because of the Center's interconnected relationship with the Office of Sustainability, we can also involve them for references or recommendations in reference to potential faculty. Just like the Sustainability Office, the Clean Energy Center would be heavily involved within student internships, giving students the responsibility to run different aspects of the organization. With that being said, Delicia Nahman's understanding of the power dynamics within a process like this could be beneficial within the hiring process. Overall, the Sustainability Office should have a significant say within hiring faculty, based on how often these offices and faculty will be interacting.

In order to establish a center on campus dedicated to clean energy, there are many technical and organizational challenges that have to be addressed not only by Lafayette, but also by the community. To establish the Lafayette Clean Energy Center, the school would need a large proposal, outlining the benefits, costs, and logistics surrounding the creation of such an organization. The process would involve crucial collaboration with the Office of Sustainability, as well as other organizations and faculty.

Economic Context

Funding new solar projects can be an expensive undertaking and is often the main roadblock preventing new arrays from being built. One benefit available to solar energy projects that can help get them off the ground is the renewable energy credit (REC) program. The federal government gives entities the ability to sell REC that they are given for any renewable energy they generate that exceeds local renewable portfolio standards

(RPS)[40]. This gives universities a unique opportunity to sell their RECs. At ASU, they sell most of their on-campus credits to third parties in order to help them meet their renewable energy goals. They can then use the extra funds gained to finance further projects, or they often choose to maintain their extra credits in order to reach their own strict sustainability goals. At Lafayette, while our solar array is at a significantly smaller scale compared to ASU's program, we can also attempt to make use of similar programs now and in the future. As the college moves closer to meeting its carbon neutrality goals, selling REC's can be an integral part of funding further solar projects, or allowing the community to invest in the college's solar program to engage with them and allow smaller groups to help support solar energy initiatives.

The Solar Array itself, and by extension the LCEC, also provide an essential economic source for the Lafayette curriculum. Renewable energy projects, especially solar arrays, are often expensive and economically complicated. The databases located in the LCEC, and the access to the Kirby Solar array provided by the Kirby Solar Lab will give the Economics department at Lafayette the opportunity to offer renewable energy economics classes or research. The field of renewable energy economics has grown significantly in the last decade, and will continue to do so. This makes the Kirby Solar Array an essential research and learning tool for not just the Economics department, but also various engineering departments as well.

In order to break down the economic costs associated with the new energy center, we chose to break our necessary materials and equipment costs into two sections: The

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[40] Rupp Carriveau, & David S-K. Ting. (2018). Wind and Solar Based Energy Systems for Communities. The Institution of Engineering and Technology.

Renewable Energy Center (LCEC) in RISC and the Clean Energy Laboratory in Kirby Sports Center. When calculating the cost of the Renewable Energy Center we first modeled what we believed the center would need to operate. For this model we used the current office of sustainability located in Rockwell. In order to get the center up and running we estimated that we would require at least 2 professional staff members to work at the center full time, in tandem with the office of sustainability. In addition to these staff members we would also require the necessary furnishings to complete the center which we estimate to include 2 computers, 2 desks, a conference room style table, 4 chairs, as well as other necessary office supplies. Given these necessities, we estimated the cost of the LCEC to be roughly $121,998.75 (See Table 1).

Table 1: LCEC Rough Cost

LCEC Cost

Item	Qty	Cost Per Unit	Total Cost	Notes
Desks	2	$399.99	$799.98	Executive Desk by Brush Finish
Computers	2	$250.42	$500.84	By Bush Business Furniture
Confrence Room Table	1	$439.99	$439.99	Rough Price
Chairs for the Table	4	$42.99	$171.96	Can be used from supply already on campus
Desk Chairs	2	$42.99	$85.98	Can be used from supply already on campus
Professional Staff	2	$60,000.00	$120,000.00	Annual Compensation
		Total Cost	$121,998.75	

For our second group of costs, the Kirby Clean Energy Laboratory we modeled our estimate off of the necessities and equipment needed to develop a working lab in the Kirby Sports Center. First, we determined we would need computers, desks, white boards, and other learning materials. After estimating the cost of these materials (see Table 2 below), which could also be sourced from extra supply within the college, we set out to determine the cost of constructing a microgrid similar to the one used in the Lehigh SMRT Lab. After attempts to find pricing of the individual components, our group was able to find an estimate from Microgrid Knowledge,[41] a think tank on Microgrids and other energy issues which noted that an average microgrid for use on college campuses typically costs $3.3 million dollars per megawatt. Once we had this figure, noting that the Kirby Solar Array is 470 kW or .47 megawatts we did a simple calculation to estimate the cost of the microgrid to be roughly $1,551,000. In tandem with the cost of constructing the lab, we estimate a total cost of $1,568,300.

[41]Microgrid Costs and How to Lower Them: Microgrid 2021. (2021, May 28). Retrieved from https://microgridknowledge.com/microgrid-costs-microgrid-2021/

Table 2: Partial Cost of Kirby Lab

Kirby Renewable Energy Lab				
Item	**Qty**	**Cost Per Unit**	**Total Cost**	**Notes**
Desks	20	$400.00	$8,000.00	Executive Desk by Brush Finish
Computers	20	$350.00	$7,000.00	Can be used from supply already on campus
White Board	2	$650.00	$1,300.00	Heavy Duty White Board
Chairs	20	$50.00	$1,000.00	Can be used from supply already on campus
		Total Cost	$17,300.00	

Conclusion

In reviewing the initiatives that can be developed around the Kirby solar array, it is clear that the college has many directions that it can go to maximize the potential benefits of the newly constructed array. In reviewing our case studies of other peer institutions that have developed similar solar projects on their campus, we can learn from them and use some of the ideas they have developed as examples to benefit both the Lafayette and Easton community. Implementing similar initiatives to strengthen community ties, integrate the solar array into the curriculum, and develop future solar projects on campus off of the success of array Lafayette can strengthen its public image while also serving as an example of sustainability to other institutions of higher learning.

We envision the creation of the Lafayette Clean Energy Center as the first step in making Lafayette a more green institution, and a leader in the renewable energy field.

In this report we've outlined what we envision the LCEC and the accompanying Kirby Solar Lab could look like. We believe that the Rockwell Integrated Science Center is the ideal location for the energy center because of the building's purpose, and it's proximity to the existing Office of Sustainability. Designating a space, and securing initial funding, is the first step to making the energy center a reality. It will create visibility for the program from students, faculty, and guests who are visiting the science center. A dedicated space is also the first step in allowing interested students and faculty to meet and begin planning or even hosting some of the energy center's first events and programs. After a space is created, this will allow the area to be populated with equipment for the database and other materials for students to access. And once dedicated faculty have been hired to help run the LCEC, planning can begin for some of our larger envisioned programs such as a solar competition as well as more widespread integration into the Lafayette curriculum. It is important that all aspects of the Lafayette community get involved with the energy center in order to achieve the goal of interdisciplinary involvement. Once the array is involved in the Lafayette curriculum, the Kirby Solar Lab can be established and populated with the necessary equipment to fulfill the needs of any department who wishes to make use of it. This is why creating the physical space for the LCEC is important, as it can help relay our vision for the LCEC to the Lafayette community, then allowing discussions to take place of how different members of the community want to make use of the space. From there, the LCEC faculty can work together with community members to organize and host the various programs we have proposed, or new ones that members of the community suggested as well. We hope the LCEC and its accompanying programs will continue to expand as the Lafayette and Easton community make use of them, and as Lafayette continues its investments in clean energy technologies.

The Lafayette Clean Energy Center is an essential step in getting the most benefit out of the college's existing renewable energy investments, as well as ensuring future benefits and adoption of similar projects. The clean energy center will give Lafayette the opportunity to create and implement many similar programs to other schools, advancing our renewable energy research, learning, community engagement, and philanthropy opportunities. The Kirby Renewable Energy Lab will just be the first example of this, giving students hands-on experience working with the school’s investment in the Kirby solar array providing learning and research opportunities.

From there we hope the clean energy center will continue to serve as inspiration and an important resource for further clean energy initiatives on campus while working to involve all disciplines on campus in this important aspect of our modern world. It will serve as an essential launchpad for future sustainable investments and help the college achieve it’s sustainability goals laid out in the Climate Action Plan including carbon neutrality by 2035. Lafayette has already shown its commitment to working towards these goals with the investment in the Kirby Solar Array, the creation of the Office of Sustainability, and other programs. If Lafayette is going to continue this push and solidify itself as a frontrunner in the renewable energy space, as well as bridge the divide between campus and the Easton community, then we see the Lafayette Clean Energy Center as the essential first step.

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