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### Solar Energy at Olin College

Humans are making Earth inhospitable for future generations of people and other animals to live. The unmistakable correlation between carbon dioxide concentration in the atmosphere and the endangerment, even extinction, of other life forms serves as the primary motivation in the shift from the usage of fossil fuels to solar energy. Rather than succumbing to the simple capitalistic virtue of burning natural gas for electricity because of its low cost, hope has not been lost in decelerating and eventually reversing the environmental destruction by harnessing this renewable energy source. In order to take measures to recuperate the current conditions, working on the institutional level is a powerful tool. Harmonizing Olin College's ideology of change and sustainability with its lack of resources in solar energy holds an opportunity to access this scale. However, the progressive notions of the college and its successful student-driven initiatives provide a realistic method for improving this situation. Installing solar panels will demonstrate the capability of students to achieve action after conceptualization, reaffirming the traditional belief at Olin in which students should be the force pushing proposals. The multitude of positive effects would be distributed across undertakings varying from saving electricity costs, preserving the environment, and overtly proving the ideology of Olin College.

Since Olin College's founding, the college has striven to reduce student financial burden, initially by providing full scholarships to all enrolling students (Flaherty). However, due to the most recent economic downturn, Olin could only provide a half-tuition scholarship to all students who had enrolled after 2009 (Nolan). In fact, Charles Nolan, the Dean of Admission, states "Olin was founded on the premise that financial considerations should not stand in the way of an excellent engineering education... Our priority in these deliberations was maintaining the quality of Olin's academic

programs.” (Nolan) The cost-cutting steps taken go against the college’s original intention and could have possibly resulted in a reduced quality of education, which implies that money must be in the process of being handled frugally. The Olin College administration had also been looking toward the future. The rationale behind installing solar panels is much the same. Olin College, like any other university, must consume enormous amounts of energy to maintain cutting-edge equipment and technology as well as for security and safety purposes. Even so, Olin has been able to cut the amount of electricity used since the construction of all the buildings by more than 37%. Continuing on this path, solar panels would prevent fossil fuel based shortcomings: The energy expenses incurred never decrease with consistently rising prices as which are derived from non-renewable resources. While the dilemma may not seem to be very problematic in the short-term, in the future, non-renewable resources will be in high demand but short in supply. Erecting solar panels around the campus is not an issue. Inefficient parking lots can be transformed into car ports that not only convert solar radiation into usable electricity, but also prevent cars from overheating in direct sunlight and forcing drivers to turn on air-conditioning systems. There also exists companies that specifically cater to institutions and provide plans in which solar cells are maintained by said company, but the energy input would be at a fixed low cost in comparison to the current energy provider. This proposition would not charge the college for any overhead costs. With such viable plans, solar energy is an environmentally-sustainable method of taking control of Olin’s energy future.

Modern climate change due to human activity is one of the most significant factors in changing nature. The average surface temperature of the world has increased by more than 0.3°C (“Global Warming”) in the past fifty years. This seemingly insignificant change in temperature indicates that the rate of temperature increase has nearly doubled since the last period of fifty years (“Global Warming”). This is likely to manifest in changes in extremes of temperature and precipitation and even a rise in sea level (Karl 1719). A rise in sea level can be especially dangerous for coastal and low-altitude areas. In Australia, “For every metre of sea-level rise it is estimated that sedimentary coasts will retreat by 20-200 m.” (Rowland 31) With enough time and enough thermal energy, port cities such as New York and Boston have a strong chance of deteriorating as sea-levels increase and extreme weather

occurs more commonly. The ozone layer, which protects the Earth from harmful solar radiation, disintegrates when exposed to lingering chemicals in the atmosphere, chlorofluorocarbons (CFCs) (Cohn 648). Away from home, "NASA computer models have projected a ten percent ozone loss by the middle of the 21<sup>st</sup> century if CFC usage continues to grow at three percent per year." (Cohn 648) However, all of these predicted models of climate change include a continuously escalating value of chemical output by humans. Such hypotheses have an ordinate chance to fail if aforementioned chemical outputs were to decrease or even halt. In fact, the same source that determined the ozone loss by continued CFC usage explained that the model used was already erroneous (Cohn 649-50). In the amount of time that it took to publish the results of the paper, the ozone conditions had already improved. This leaves more than just a glimmer of hope in the turbulent natural forces at play. Human impact is reversible. The future simply lays in the actions of the present. The effect of promoting solar energy at Olin College will be compounded by joining a greater movement to preserve the natural ecosystem. The potency of a campaign at Olin is much stronger than that of one held by an individual. Once a model institution joins the bandwagon, other institutions will follow suit, pressured by trend. By inspiring other organizations, Olin College would be hastening the process.

Olin College demonstrates its ideology simply by its approach to success in only a decade of existence. By placing second in the International Robotic Sailing Competition in the first year of the club's founding, Olin showcased to the world the ability of its students. This action-oriented demonstration is the concept behind the communication of Olin to the rest of the world. The goal-oriented thought of bringing solar panels to the campus in order to improve the environment is an endeavor that Olin can praise by achieving. Just as Olin College was founded on the principle that engineering education needed to be revolutionized and leads the way on improving teaching methodologies and policy planning to permit feasibility at other institutions, Olin College can take advantage of this situation and help other colleges bring solar panels to their schools. This action-oriented idea would be reaffirmed and Olin could be leading the way in "Green Engineering Education," attracting engineers and sustainable-design professors alike. In fact, the honor code of Olin College explicitly states under the "Openness to Change" clause, "I will be receptive to change,

supportive of innovation, and willing to take risks for the benefit of the community.” Faculty and students alike adhere to the honor code; it is central to the philosophy of the college. The construction of solar panels at Olin would require all members of the Olin community to invoke that section of the honor code. The clause was written in such a way that Olin would be conducive to change per student initiated request. Now one of such a request has arrived and initiation only requires the backing of the student body. Any overhaul of the facilities that Olin College owns has a certain processing time, especially on the scale of introducing a new source of electricity for the college. A problem should not arise given active engagement within the Olin community. Olin College also has a tenet of “learn by doing.” The curriculum is organized in a structure that forces students to actively participate in activities that require a skill that students do not have any training on. For instance, in a class called “Design Nature,” students with little to no Computer Aided Design (CAD) knowledge are expected to experiment with motion visualizations of a multiple-part assembly and later fabricate a hopping toy using laser-cut parts. While they are adjusting to meet the demands of the work given to them, students learn what is necessary and useful at the same time. Their theoretical knowledge is an application of the practical necessities of the type of work they needed to complete. Lectures on physics, design, and biology would be given that would most help with the work that the students were finishing at the time. By extension, by beginning to approach authority figures and planning real-time, the solar panel preparation project leaders work just as though they were working on a committee to negotiate with solar panel construction companies.

Olin College was founded on progressive premises and ideals: exams are an inaccurate measure of a student’s ability to reason and problem solve; engineering in this day in age requires more teamwork and cooperation than individual skill; practical solutions do not need a strong theoretical background. By taking these ideas and providing physical representations: project-based curriculum; team-based work; Senior Capstone Projects, the college was able to launch into success. Now, even a decade after the admittance of its first class and its change in scholarship policy, students are still trying to actively change foundations by the introduction of solar panels. Olin College

is already revolutionizing engineering education. Why don't we revolutionize green energy while we are at it?

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