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Sustainability and Education

I. Sustainability Education and Macalester's Institutional Goals

Macalester College presents itself as a progressive institution. As a community of inquisitive students, faculty, and staff, we undertake the pleasure and responsibility of forward thinking. Generally speaking, we make commitments based on driven and challenging inquiries, which is fundamental to how we attract the next iteration of hopeful students. One of our most impressive commitments is our dedication to fostering a more sustainable campus and community environment. Currently, Macalester is well on its way: diverting 90% of our waste from landfills; serving 30% local, organic, humane, or fair trade food at our dining hall; becoming carbon neutral by 2025; acting as a Living Laboratory for sustainability innovation in an urban setting; connecting sustainability to health and wellness; and supporting sustainability education in our curriculum, to name a few. Furthermore, Macalester has revamped campus infrastructure by incorporating sustainable practices and technology. It has installed green roofs and solar panels, paving walkways with porous cement, and planting native species in lieu of ecologically expensive lawn spaces.

Sustainability education, however, is horizontally integrated across the majority of Macalester's other goals. Many of our pledges implicitly or explicitly require sustainability education. In particular, our carbon neutrality goal is estimated unattainable without carbon offsets in the form of "off-site renewable energy for 48 percent of its emissions".¹ While Macalester will hopefully be able to fill this disparity with conscious investments, we are foremost an educational institution. One of the primary ways any educational institution offsets its significant carbon usage is by empowering its graduates with the knowledge they need to innovate new technologies and manage new systems that will decrease future carbon needs, no matter to which faculty or field of study they may belong. Marcus Ford wrote in the American Association of University Professors monthly publication that "The only justification for an institution of higher education is that it serve the greatest needs of a particular civilization. The greatest need of our civilization, at this moment, is learning to live sustainably and justly within the bounds of the

¹ Sustainability Office, Macalester College. *Macalester College 2016 Sustainability Plan-Draft*. 2015.

natural world”.² Thus, Macalester’s commitment to sustainability education becomes increasingly relevant, specifically to each new generation of college students who have to live in the world as it is. Sustainability does not only benefit Macalester’s morals. From a financial perspective, graduates well-versed in sustainable practices will be more competitive in a job market that will have to adapt to climate change, our new reality. Sustainability-savviness is more and more in demand, and will only continue to grow. Our commitment to sustainability education is a return on students’ investments in Macalester.

Infusing sustainability through connected, coordinated activities into all aspects of the educational endeavor – research, teaching, and our engagement with the community beyond the campus – means that more students will internalize and embrace the values of sustainability and ask the questions that support sustainable outcomes for our society. Not only do the efforts described here align with our mission, our efforts are also grounded in the college’s current strategic plan, *World Class: Strategic Imperatives for Macalester College, 2005 to 2015*. This sets forth Macalester’s fundamental goal: to “become widely recognized as a college distinguished by exceptional academic quality, a pervasive sense of excitement and innovation, a keen awareness of the changing world into which we are sending our graduates, a distinctive and demonstrable commitment to the education of socially responsible global citizens and leaders, and a student experience informed and enhanced by a rich urban environment.” The *World Class* strategic plan continues to guide key decisions made about the college and its future and also dovetails with our vision for a curriculum and co-curriculum steeped in sustainability.

II. Statement of Purpose

Following the time-honored Macalester tradition of students and faculty working together to influence campus policy, we seek to cultivate understanding of the broad dimension of sustainability among stakeholders by embedding its comprehensive definition within Macalester’s fundamental institutional enterprise. We will do this by examining the curriculum, co-curriculum and activities, and operations here at Macalester. Our purpose is to highlight the need for sustainability integration into the Macalester pedagogical foundation, by extending across campus. To best prepare our graduates to become thought leaders in professional and civic communities, we pursue sustainability work through the perspective of our values, recognizing that post-graduate success is tied to community well-being. By blending academic and career foci, Macalester will give agency to student’s education on campus and continuing post-graduation. Specifically, we look to similar higher-ed institutions that have paved the way, examining how these colleges have been so successful in integrating sustainability throughout their

² Ford, Marcus Peter. *Education for the Common Good*. American Association of University Professors, <<https://www.aaup.org/article/education-common-good#.WEDdNVfnZE6>>, 2016.

campus and community. In order to delineate how Macalester can work toward a more sustainable future, we address the barriers that exist that restrict the permeation of sustainability into and beyond the “classroom”. Ultimately, this project hopes to shed light on sustainability as a necessary pillar for Macalester to rest on in the future, by making observable and concrete recommendations for change. We hope that it may be of service to administrators working to write policy which parallels our goals, and professors designing the curricula which make a Macalester education a strong foundation for lifelong leadership.

III. Applications of Sustainability Education at Macalester

Sustainability, as defined within the Macalester College Sustainability Plan (2009), is “the continuous effort to meet the needs of the present generation, without compromising the ability of future generations to meet their needs, by working toward a healthy environment, social justice, and a strong economy”. At Macalester, department faculty work through cross-disciplinary channels to integrate sustainability into pedagogy, aligned with co-curricular activities pursued by students. Given the resources, they have shown that they would gladly incorporate some sustainability courses into their curricula. They simply need to be catalyzed to do so.

At first glance, Macalester’s repertoire of sustainability education initiatives is impressive. The college already includes sustainability in the curriculum. Its Environmental Studies major and minor programs offer a degree which allows students to specialize in sustainability and develop a “holistic understanding of environmental issues occurring at the local, national, and global level”. The Environmental Studies major program is one of Macalester’s strengths. It has only grown more popular since its instigation in 2006.³ It additionally has been making steady progress on increasing sustainability learning both in and out of the classroom, as well as connecting students with opportunities to extend their learning after graduation. Research, however, has declined in the 2010-2011 academic year.⁴ That being said, Macalester has a wealth of environmentally centered student organizations: Mulch, MacBike, Fossil Free Mac, and MacFeast, to name a few. These are student initiatives, and they demonstrate the fervor of Macalester students to take positive climate action. They are financially supported by the administration, and many have faculty members as facilitators. They are representative of Macalester’s unified populus.

³Macalester College Website: Home>Academics>Environmental Studies>About

⁴Sustainability Office, Macalester College. *Social, Economic and Environmental Sustainability at Macalester College*. December 2012. <<http://www.macalester.edu/sustainability/data-reports/reports/SustainabilityatMacalesterDecember2012.pdf>>. December 2016.

A. ESA Grant

Since 2014, Macalester has received funds from the Cargill Foundation to pursue sustainability programs. It is a triumph for the Sustainability Department at Macalester, which gained significant flexibility after previously having a relative dearth of funding. This grant, on the order of \$650,000, has allowed us to create some and bolster some of the following initiatives:

- Sustainability fellows

A fellowship in which students identify a local, regional, or international partner organization with whom to work on a sustainability problem presently faced by the partner.

- Student-faculty directed research

Macalester has four [ongoing faculty research projects](#) in the Environmental Studies Department, which majors and nonmajors alike may use to supplement their coursework with real-life experience.

- Student development

Our “Live It” fund provides Macalester start-ups capital to implement innovations in nonprofit social entrepreneurship. Additionally, we host “Macathon”, an annual competitive think-tank, and, in our 2014 [report](#) from the Strategic Planning Committee, set goals to “develop through the regular committee channels courses and programs that expand the curricular presence of entrepreneurship”.

- Shared value practicum

A three-week, intensive, cross-cultural experience focused on sustainability which takes place off-campus (in the US or abroad) and is preceded by on-campus readings and guest lectures. Faculty and students work in collaboration with each other and with a cohort of their peers, together with a partner organization, around an issue relevant to sustainability.

- International Round Table (IRT)

A public forum featuring guest lecturers, workshop sessions, and panels, with the goal of showcasing the progress and results of our work related to this grant, inspiring the replication of the curricular and co-curricular models, and nurturing future partnerships with community members.

Our many sustainability-focused projects showcase our ongoing progress towards providing our Environmental Studies students with intersectional prospects outside the classroom. However, the ESA grant is nearing its end, and will be up for renewal at the end of this fiscal year. As a result, our Sustainability Fellowship has been postponed indefinitely, and others will have to be curtailed if the grant is not renewed. This poses a serious threat to the progress we have already made through these programs

III. Our Approach to Assessing our Sustainability Curriculum

A. Metrics: STARS

_____ While there is noticeable contention among sustainability professionals regarding how to measure progress in a field so varied and diverse, we have opted to use the Association for the Advancement of Sustainability in Higher Education (AASHE)'s Sustainability Tracking, Assessment & Rating System (STARS) on the basis of its unbiased, comprehensive nature and applicability to our existing framework. STARS performs an audit with the help of the institution and returns a score based on Institutional Characteristics, Academics, Engagement, Operations, Planning & Administration, and Innovation. The number of overall marks changes depending on a few different criteria, such as whether or not the college or university is pursuing a graduate program. Our assessment includes only the Academics section of the report, but there are gains to be made everywhere, just none so significant. Macalester overall receives a Gold rating for its 66.99 marks. To achieve a STARS Platinum rating, Macalester would have to have a total of greater than 85 marks.

B. Data

We include a brief report on the STARS scores of Macalester and related institutions to shed light on how Macalester “stacks up” to competition, and how we can make tangible issues within specific areas to increase sustainability education and uptake on campus, within curriculum, co-curricular activities, and operation.

Ratio	0.735	0.517	0.889	0.983	0.827	1	0.576	0.724
Academic Research	9.18/12	6.3	12	11.71	10.89	12	7.38	9.03
Support for Research	4/4	3	4	4	4	4	3	2
Access to Research	.05/2	0	0	2	0	X	0	2

C. Assessment

Academics is, by a wide margin, the area where Macalester falls farthest short. Of a total of 37 points, we have earned only 20.95, for an overall ratio of 0.566. It compares favorably or the same to Vassar, Unity, and Villanova, but lags behind the rest of the institutions by more than 20% in some cases. STARS reports that we have the most work to do in offering enough sustainability courses, and subsequently we also fall short in the learning outcomes category. We suspect that, with increased sustainability offerings, these would come naturally.

Using the sustainability education section to get to a higher status rating is a commonly used strategy by the above colleges and universities, all of which were chosen for their similarity in creed, size, and nature to Macalester. Vassar College, in particular, increased their sustainability offerings in order to advance to Gold status. This strategy is favored because it requires no new infrastructure to get notable returns in graduate preparedness and sustainability literacy.

Macalester falls in the middle of the pack. Does this line up with the rhetoric in its pledges to climate excellence? Macalester has signed on to binding promises towards the goal of excellence in sustainability. In order to meet that standard across the board, it's obvious that work must be done in this sector of development.

This leads us to question what we can do to offer more sustainability courses. Which departments need an increased presence?

D. Efforts: Related Institutions

Results from a survey distributed across disciplines indicate that students majoring in Environmental Studies have a more accurate sense of the effectiveness of sustainability initiatives than do

students from other majors (C. Manning, personal communication, October 20, 2016). However, sustainability as a principle transcends the scope of a single major, and we must address this discrepancy. Graduates must have the academic foundation and applied experience to engage in further study in order to buttress sustainable lifestyles, as well as encourage careers based on the commitment to social, economic, and environmental sustainability. A college's success is measured by the relative success of its graduates: at Macalester, graduates must possess the skills and desire to move toward sustainability in all spheres of their lives. To remain a leading institution of liberal arts education, it is paramount that Macalester invests in sustainability as integral to the professional, personal, and social community of students, faculty, staff, and greater community.

We approached this project with special regard for practices that have worked elsewhere, lessons learned from our own initiatives, and delving into contemporary research regarding the role of higher education in creating a sustainable future. As alluded to earlier, we also give credit to the successes of other institutions within the context of higher-ed sustainability, acknowledging our common stake in living low-impact.

Macalester is not alone in the pursuit of more sustainable campus systems. Below are a collection of similar institutions that have effectively incorporated sustainability and relative tenets into curriculum.

Table 2: Index of colleges/universities with a sustainability-focused certificate program

College	Type of Certificate	Requirements	Application
Temple University	Sustainability	Classes → 12 credit interdisciplinary; GPA min. 2.0	<ul style="list-style-type: none"> ● Further knowledge and skills to contribute to sustainable systems. ● Help students become effective leaders and agents of change for sustainability. ● Make students more competitive in the changing job market: green collar economy.
Arizona State University	Energy & Sustainability	Classes → 15 credit (9hrs of required courses and 6 hrs of elected)	<ul style="list-style-type: none"> ● Overview of how energy affects peoples' lives and policy options for energy. ● Science of energy and how energy is generated for today's society. ● Additional energy courses tied to geography, architecture, geology, engineering, or economics.
	Food Systems	Classes → 15 credit (3hr required; 12 hrs electives-- divided into 2 Tiers)	<ul style="list-style-type: none"> ● Draws from food-related courses in the social sciences, humanities, life sciences, and applied sciences. ● Each discipline approaches food sustainability from a different angle.

			<ul style="list-style-type: none"> ● Seeks holistic understanding of food-related challenges and solutions.
Wellesley College, Franklin W. Olin College & Babson College (Tri-College)	Tri-College Sustainability Certificate	<p>Classes but course with semester-long project; practical experience involved.</p> <p>8 credit required courses (2 classes) ; and 16 credit electives (4 classes)</p>	<ul style="list-style-type: none"> ● Educate students to make use of the skills, tools, and concepts from the liberal arts, business, and engineering to address environmental challenges. ● Evaluate potential paths towards sustainability at both the individual and societal level. ● Addressing the challenge of using earth's resources sustainably requires a collaborative and interdisciplinary approach. ● Wellesley, Olin, and Babson Colleges are uniquely suited to provide a joint program capable of educating students in ways that each cannot accomplish alone.
University of Michigan	Sustainability Scholars Program	<p>Application required; academic courses (9 credit, 6 core, 3 elec.) + field experience (with \$3,000)</p>	<ul style="list-style-type: none"> ● Explore interest in sustainability while engaging in leadership training.
Amherst College, Hampshire College & Mount Holyoke	5-College Sustainability Studies Certificate Program	<p>Academic courses (3 core and then choose electives from concentration) + practical experience (internship or independent research project)</p>	<ul style="list-style-type: none"> ● Sustainability will be essential to the formulation of sound environmental, economic and social progress in the 21st century. ● Range of disciplines. ● Students complete an internship, independent research project or advanced coursework in sustainability studies.
University of Wisconsin-Madison	Sustainability	<p>Academic courses (12 credit) + community service project</p>	<ul style="list-style-type: none"> ● Interdisciplinary coursework related to sustainability. ● Learn sustainability principles and how to apply them to issues on our campus and in the wider world. ● Learning practical skills to make a difference in the world - in your life, in your job, and in your community.
University of Kansas	Sustainability	<p>Coursework & experiential learning</p>	<ul style="list-style-type: none"> ● Work to meet the goals of our modern society without undermining the resources that support them. ● Sustainability is not a study for a select few, but a life skill. ● Prepare for contributing to solutions for our present and our future.

University of Pittsburgh	Sustainability	Courses (18 credits; 2 track certificate)	
University of Iowa	Sustainability	Academic coursework (24 hours) and take project/integrative systems course; GPA min 2.0 ; courses can apply to minor/major	<ul style="list-style-type: none"> ● Requires an understanding of interactions in human/environmental systems ● Must have knowledge of the multidisciplinary breadth of the field and experience with analyzing real-life problems in and outside of the classroom ● Collaboration ● Give knowledge and skills to contribute to developing sustainable systems...enhance their preparation for a variety of vocations.
U of Colorado - Boulder	Global Environmental Affairs	Coursework & either study abroad; internship; or CU in DC	<ul style="list-style-type: none"> ● Joint Program ● Opportunities to personalize undergraduate learning across disciplinary lines and to deepen student engagement with world problems. ● Off-campus experiential component.
	Renewable & Sustainable Energy	Coursework (18 total, split evenly by core and electives) & 1 project-based class	<ul style="list-style-type: none"> ● "There is a clear and growing societal need for experts in energy, with skills and knowledge that transcend traditional disciplines. What's needed is not just technical expertise, but rather technical competence combined with a broader understanding of the business, policy, economics, and institutional aspects of energy." - CU-Boulder, Energy Education Committee, Final Report, May 2007 ● Courses on energy science and technology, policy, and economics. ● Electives regarding energy and environment, journalism, ethics, and other sustainability-related topics. ● Solving society's energy-related problems is not just a technical challenge. It will require contributions from law, business, humanities, journalism, and other disciplines as well.
Florida International University	Environmental Studies	Coursework only	<ul style="list-style-type: none"> ● Interdisciplinary environmental education to both enrich and expand the breadth of their primary training. ● Goal: analytical basis for understanding local and global environmental problems and processes.

Here at Macalester, students and faculty have worked tirelessly to strengthen and broaden the reach and understanding of sustainability as a key institutional value, yet we are missing the link between curriculum and knowledge about the relative impact of sustainable practices. Consider these above data in tandem with Macalester's mission statement. Most of these institutions have significantly more resources and students, but lack the mission that compels students to engage thoughtfully in global citizenship, and the subsequent framework for engaging with in sustainability issues. These, Macalester has. Why not, then, study and tailor these programs for academic incorporation at Macalester?

E. Obstacles

The following are obstacles that prohibit broad goals of sustainability from being accepted campuswide.

- Less awareness on how sustainability can be incorporated across departments.
- Lack of funding.
 - ESA grant is on hold, and would provide institutional support for a growing focus on sustainability.
- Not a main pillar at the college.
 - Multiculturalism, social service, and internationalism are the main foci. We can easily add sustainability into the mix, as it is already a subset of each. If we give sustainability a "spot at the table", we might finally be able to incorporate it into the college's mission statement.
- Assessment at the faculty level is difficult to implement.
- There is no official learning objective / requirement that says students need to know about sustainability, or continue education beyond the classroom (and at their own volition).
- There is no accurate sense of coordinated sustainability initiatives beyond the scope of the sustainability office.
- There is not enough dialogue around sustainability and its role within society.

IV. Recommendations

Our vision is that within 10 years, the curriculum at Macalester will be imbued with sustainability and its tenets, enough that it would be exceptional if a graduate never encounters it while studying for four years. As students gain the knowledge and tools to encounter sustainability in their daily lives, they will understand the connection between Macalester, sustainability, and global citizenship. Our students must recognize, consider, react, and adapt to sustainability issues as they are constantly changing.

Generally speaking, in the liberal arts setting students are attracted to higher-ed as facilitating growth toward becoming “agents of change”, armed to recognize the interrelated ecological, social, and economic concerns about a particular issue. This holistic view of problem-solving is critical to our program plan.

We have considered the following as possibilities for development:

1) Work to renew the ESA grant.

Increased presence of sustainability infrastructure and increased flexibility in programing would lend visibility to sustainability on campus. At present, many of the programs mentioned above are being suspended or curtailed as the end of the funding approaches. They have been greatly influential for students, and we would be well served to continue them.

2) Increase interdepartmental and cross-listed course offerings.

This will likely have to be a faculty-lead endeavor, because, at the end of the day, professors make their own curricula. Students can help by continuing to conspicuously create a social precedent and demand for sustainability courses. A renewal of the ESA grant would allow faculty the resources to rise to that demand, and also continue to galvanize interest. Ideally, sustainability offerings would increase in the First Year Course catalogue as well.

3) Institute a sustainability-focused graduation requirement

Macalester college is no stranger to graduation requirements, but our existing general requirements are not overly onerous: we have a requirement that encompasses quantitative reasoning, a writing requirement, both of which require multiple classes to complete, a United States Identities and Differences requirement, which stipulates that Macalester graduates use one 4-credit class to get in touch with one of the US’s diverse demographics, and an internationalism requirement, which does the same for an international demographic. Implementation of this task could take the form of one general education requirement, or else sustainability requirements in various majors, though this would likely take more administrative action.

4) Make Sustainability a main pillar

Sustainability is already de facto the base of three of our existing pillars; Internationalism, because climate change is a global challenge, Multiculturalism, because the burden of climate change and resource misuse falls most heavily on disadvantaged communities, making it an issue that requires diverse input and acknowledgement of privilege, and Service to Society, because perhaps the greatest service which can be made to society is one which allows more people a higher standard of living.

5) Sustainability Certificate Program

This improvement would take the form of a 16-20 credit program, with enough flexibility in its requirements to hypothetically be feasible even in addition to a major and a minor. Assuming the increase in interdepartmental sustainability classes, many of the classes could also be taken in a student's major department.

V. Looking Forward

Of the recommendations above, some strategies are more difficult to implement than others, for a variety of reasons. Some require more interdepartmental communication, some will require the college to slog through more bureaucracy, and some simply take longer by their very nature. However, short term goals will still make great progress towards improving our STARS rating, and particularly in the field of sustainability education, even small growth has the potential to raise us to a higher echelon. First and foremost, we must complete the request for a renewal of the ESA grant. The application is a somewhat arduous process, but the returns on that investment of time outweigh the difficulty. Next, we can begin increasing sustainability offerings from the ground level. This would require only a little effort on the part of the administration, to give the faculty some time to develop curricula. This effort would be further supported by our 4th recommendation, making sustainability a main pillar of the Macalester College mission. The remaining recommendations are areas of slower development, but nonetheless important on which to begin work.

Macalester's commitment to sustainability education compels it to be constantly active, constantly formulating new strategies to improve our impact on the world at large. The STARS rating system that is used in the sustainability department identified our curriculum as a key area of improvement. There is a clear and undeniable drive by other similar higher-ed institutions that we can capitalize on: this competition is necessary to the progressiveness and inquisition inherent to the college. The suggestions we have put forth in this document represent what we believe to be the greatest area of

untapped developmental possibility in the face of the challenges that climate change and resource management pose. Macalester will rise to this challenge: where sustainability is concerned, we feel that student sentiment lines up with administrative foresight, which historically, are the conditions that incubate the greatest change on campus. Fortunately, Macalester has proved to be receptive to these changes, evolving with the iterations of new students that refresh the ideology and encapsulation of liberal arts.

VI. References

- STARS (Sustainability Tracking, Assessment & Rating System). 2014, July 18. "Macalester College." Retrieved September 30, 2016 (<https://stars.aashe.org/institutions/macalester-college-mn/report/2014-07-18/>).
- Burns, H. 2011. Teaching for transformation: (Re)Designing sustainability courses based on ecological principles. *Journal of Sustainability Education*, 2.
- Ford, Marcus Peter. 2016, September. "Education for a Common Good." ANLAP. Retrieved from: https://www.aaup.org/article/education-common-good#.V_G90CMrKfS
- Hansen, Suzanne Savanick. 2017. "The Campus as a Living Laboratory: Macalester College Case Study." Pp. 223-239 in *Handbook of Theory and Practice of Sustainable Development in High Education*, edited by Walter Leal Filho et al. Cham: Springer International Publishing. Doi:10.1007/978-3-319-47895-1_14.
- HEASC (Higher Education Associations Sustainability Consortium). 2016. *Sustainable Development Primer for Higher Education Presidents, Chancellors, Trustees and Senior Leaders*. AASHE. Retrieved October 15, 2016 (<http://heasc.aashe.org/sites/g/files/g320266/f/201603/Presidents%20and%20Boards%20Primer-DS.pdf>).
- Sustainability Office, Macalester College. July 2012. *Educating Sustainability Ambassadors: A*

Shared Value Approach. Grant Application.

Sustainability Office, Macalester College. *Social, Economic and Environmental Sustainability at Macalester College*. December 2012. <<http://www.macalester.edu/sustainability/data-reports/reports/SustainabilityatMacalesterDecember2012.pdf>>. December 2016.

United Nations Educational, Scientific and Cultural Organization. 2012. *Shaping the Education of Tomorrow: 2012 Report on the UN Decade of Education for Sustainable Development, Abridged*. Cathy Nolan. Printed in France: UNESCO. Retrieved October 12, 2016 (<http://unesdoc.unesco.org/images/0021/002166/216606e.pdf>).

Lee, Zhe Yu. 2015. "The Brain", October 22nd, 2014. Macalester College.

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