

Strategic Plan Proposal

SUs tain a bil i ty:

Refocusing institutions of higher education on sustainability goals in order to challenge the campus community and minimize its environmental impact, while improving the quality of life and the future of the campus. Additionally, institutions of higher education should educate students on the core values of sustainability so that graduates will enter the world as role models.

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Contents:

PAGE 4 INTRODUCTION

PAGE 5 LITERATURE REVIEW

The Responsibility to Create a Sustainable Learning Community (5) Creating a Sustainable Campus: Benefits and Challenges (8) Common Sustainability Initiatives at North American IHEs (10)

- Administrative, Personnel, and Curricular Reforms
- Infrastructure Projects
- Green Funds
- Civic Engagement Initiatives

How Does Southwestern Measure up to Other Institutions? (15)

PAGE 16 MEASURES

Explanation of STARS Rating System Sections (17) Relevant Contacts (17) Summary of AASHE Benefits (18)

PAGE 20 REFERENCES

PAGE 24 APPENDICES

Appendix A (24) Appendix B (25)

INTRODUCTION:

Recent decades have witnessed a growing sense of environmental awareness and responsibility as issues such as pollution, biodiversity loss, resource depletion, and climate change have become global concerns. While much attention is often focused on treaties or policy decisions made at the national and supranational level, measurable differences are occurring at a local scale. Recently, institutions of higher education (IHEs) have emerged as regional leaders in the research, education, and practice of environmental sustainability. These institutions serve as avenues for teaching students about sustainability and as living laboratories that allow faculty, staff, and students to expand upon the current boundaries of sustainability education. This crucial, because IHEs are tasked with is the development of future leaders, scientists, and other professionals that will one day assess current initiatives as well as create innovative sustainability initiatives of their own (Brown & Hamburger, 2012; Sibbel, 2009; Cellini et al., 2008; Eagan et al., 2008; Rappaport, 2008; Wals & Jickling, 2002). Because IHEs have the ability to function as centers of learning and research, and often act as communities within communities, they are uniquely positioned as important promoters of sustainability.

Consequently, campus sustainability efforts have materialized across the nation in various forms, including energy conservation, creation of sustainability offices and/or committees, sustainably-minded building construction and renovation, waste management, improved dining operations, curriculum development, civic engagement, and green funds (Brown & Hamburger, 2012; Pursehouse, 2012; Crowley, 2009; Bacher, 2008; Rappaport, 2008; Beverage et al., n.d.; AASHE, 2013). An entire field of research has emerged that focuses on the theory and practice of sustainability, and organizations such as the International Sustainable Campus Network (ISCN) and the Advancement of Sustainability in Higher Education (AASHE) help IHEs to better understand the intricacies of implementing sustainable initiatives. In addition, IHEs are taking it

upon themselves to conduct their own research, collaborate with fellow institutions, and sign sustainability commitments such as the Talloires Declaration and the American College and University Presidents' Climate Commitment (ACUPCC). This proposal attempts to determine how Southwestern University currently fits into the broader picture of institutional sustainability and to evaluate the university's potential future impact on the local, regional, and global environment.

The Spring 2014 Environmental Capstone students' research has thus far presented a set of themes that capture and crystallize the meaning of "campus sustainability." The literature's overarching recommendations associated with reducing humandriven environmental impact include, but are not limited to: mitigating climate change, preserving lifesustaining resources (air, water, soil), protecting biodiversity, promoting clean and renewable energy, reducing consumer waste, and adopting a healthy environmental cultural consciousness. References for this research include numerous peer-reviewed academic journals such as New England Journal of Higher Education, International Journal of Sustainability in Higher Education, and Environment, as well as institutional reports and books published by university presses. Further, this research also relies on the work of collaborative networks for college communities across the globe-most notably, the aforementioned ISCN and AASHE-which provide a wealth of resources, advice, and networking opportunities. For reasons of comparison and context, the information provided in this document and the recommendations made will be discussed within the context of Southwestern University's peer institutions in the Associated Colleges of the South (ACS), comparative institutions provided in the Carnegie Commission on Higher Education list, and IHEs around the country who are noteworthy for their commitment to sustainability. In the unfolding of this research proposal, the case-specific details from IHEs will be utilized as relevant models for the

initiatives that Southwestern seeks to accomplish in the coming years.

The literature review aims to reinforce the work completed at Southwestern over the years in regard to sustainability and to inform avenues for future progress. By analyzing sustainability efforts on campuses from around the country with similar academic compositions, this document will also lay the scholarly foundation for future proposals at Southwestern. In terms of environmental practice, our main research aim is to gather data from various campus groups and assemble a sustainability strategic plan outlining the areas that Southwestern must improve on to rightly earn a title as one of the "greenest" universities in Texas.

Methods or measures for this study will include data collection of current and past metrics of sustainability and environmental awareness, including past carbon inventories, data gathered for the President's Climate Commitment report, the Talloires campus-wide sustainability survey, and primary data collection conducted by the members of the capstone class. In addition to writing a sustainability strategic plan, the capstone cohort will draft proposals for sustainability initiatives that address current and future needs. An overarching goal of the 2014 Environmental Studies capstone class is to find the best means by which to promote Southwestern as a symbol of environmental sustainability in Texas. As a first step, our class has recently (Spr. 2014) made Southwestern a member of AASHE. Through its new AASHE membership, Southwestern will have a platform for comparing its level of sustainability to that of other member schools via AASHE's Sustainability Tracking, Assessment & Rating System (STARS) program. This system allows AASHE member institutions to better calculate their ecological footprint with a consistent model that they can then use to compare themselves other member institutions. Southwestern's with AASHE membership can drive novel and creative approaches to sustainability on its campus. In doing so, the next logical step of the capstone class is to discuss the possibility of a green fund on our campus that can

aid in the implementation and fruition of Southwestern's sustainable projects and proposals.

LITERATURE REVIEW:

In their position as IHEs, colleges and universities are often viewed as leaders in emerging movements and technologies, and for at least two decades now, IHEs have materialized as important living laboratories for environmental responsibility and campus sustainability efforts (Barlett & Chase, 2013; Posner & Stuart, 2013; Aber et al., 2009; Crowley, 2009; Sharp, 2009; Sibbel, 2009; Thompson & Creighton, 2007; Cortese, 2003; Fien, 2002; Wals & Jickling, 2002).

Since the 1990s, a growing body of scholarly literature has paralleled this trend by investigating and addressing the various issues that surround the practice of sustainability in higher education. This review is a compilation of the most common themes within the scholarly and professional literature concerning IHE leadership, environmental action, and the benefits and challenges associated with sustainability efforts.

The Responsibility to Create a Sustainable Learning Community

The promotion of environmental sustainability at IHEs is a rapidly growing trend, and these institutions have the responsibility to respond to the global call to action put forth by national and international organizations (Barlett & Chase, 2013; Crowley, 2009; Sharp, 2009; Sibbel, 2009; Bacher, 2008; Barlett & Chase, 2004; Wright, 2002). These calls to action often take the form of declarations (see Table 1), many of which have already been signed by numerous institutions (Northland College, 2014; Washington and Lee University, 2014; Wright, 2002). Common principles (see Table 2) that tie these declarations together include: "sustainable physical operations, sustainable academic research, environmental literacy, ethical and moral responsibility, cooperation amongst universities and countries, the development of interdisciplinary curriculum, partnerships with government, nongovernmental organizations and industry, and public outreach" (Wright, 2002, p. 11). These declarations are motivated in part because IHEs now recognize that they hold a unique leadership role when it comes to sustainability. As Cellini et al. (2008) argue, IHEs have a responsibility to provide "the knowledge, skills, daily routines and values of sustainability to apply to [graduates'] future employment, consumption and investment decisions, lifestyle choices, and to the improvement of communities and political systems in which they live" (p. 8).

Chronology of Some Declarations Related to					
Sustainability in Higher Education					
Year	Declaration				
1972	The Stockholm Declaration on the Human				
	Environment				
1977	Tbilisi Declaration				
1990	University Presidents for a Sustainable Future:				
	The Talloires Declaration				
1991	The Halifax Declaration				
1992	Report of the United Nations Conference on				
	Environment and Development-Chapter 36,				
	Promoting Education, Public Awareness and				
	Training				
1993	Ninth International Association of Universities				
	Round Table: The Kyoto Declaration				
1993	Association of Commonwealth Universities'				
	Fifteenth Quinquennial Conference: Swansea				
	Declaration				
1994	CRE-Copernicus Charter				
1997	International Conference on Environment and				
	Society-Education and Public Awareness for				
	Sustainability: Declaration of Thessaloniki				

Table 1: (Wright, 2002, p. 1)

Many IHEs are furthering this aim by making definitive shifts in the way sustainability is taught. Rather than simply offering environmental studies or sciences classes, several authors suggest that sustainability should be a common theme throughout all departments and disciplines (Brown & Hamburger, 2012; Krizek et al, 2012; Brinkhurst et al., 2011; Sibbel, 2009; Thompson & Creighton, 2007; Cortese, 2003). Many point to the inter- and multi-disciplinary nature of sustainability as justification (Dunn & Hart-Steffes, 2012; Sibbel, 2009; Eagan et al., 2008). It is also argued that sustainability should be incorporated into campus life in a way that challenges traditional thoughts regarding interactions between humans and the environment (Cellini et al., 2008; Cortese, 2003; Wals & Jickling, 2002). In essence, higher education institutions must challenge students to think differently about the way they interact with their environments now and in the future.

To teach students to think differently means the institution and the faculty must collectively work toward shifting educational paradigms. Learning does not end at the classroom, but extends into the social realm as well. Sibbel (2009) refers to the need for civil education, or rather teaching students to be active citizens. Indeed, colleges and universities have often been cited as centers for service learning, and in recent years, civic engagement has become a core principle of sustainability education and action at IHEs (Dunn & Hart-Steffes, 2012; Cellini et al., 2008; Rappaport, 2008). The connection between service and experiential learning requires an increased awareness of the intrinsic social values connected to sustainability (Wals & Jickling, 2002). In all, Wright (2002) points out the overarching need for an increase in environmental literacy among institutions. Current leaders in environmental sustainability are working toward increased environmental literacy in all members of the institution, and the literature addresses this as a prominent need if higher education as a whole is to adopt sustainability as a core value and mission (Thompson & Creighton, 2007; Wals & Jickling, 2002; Wright, 2002). As a result, many IHEs have already incorporated values into their mission statements that are compatible with sustainability, such as fostering service and developing an educated citizenry (Dunn & Hart-Steffes, 2012). However, a significant amount of literature stresses the importance of including an actual commitment to sustainability in the mission statement (Dunn & Hart-Steffes, 2012;

Policy/Declaration	Moral Obligation	Sustainable Physical Operations	Encourage Sustainable Research	Public Outreach	Inter- University Cooperation	Partnerships with Government, NGOs and Industry	Develop Inter- disciplinary Curriculum	Ecological Literacy
Stockholm Declaration	Х			Х				Х
Tbilisi Declaration	Х		Х	Х		Х		Х
The Talloires Declaration	Х	Х	Х	Х	Х	Х	Х	Х
The Halifax Declaration	Х			Х	Х	Х		Х
The Kyoto Declaration	Х	Х	Х	Х	Х	Х		Х
Swansea Declaration	Х	Х	Х	Х	Х			Х
CRE Copernicus Charter	Х		Х	Х		Х		Х
Thassaloniki Declaration	Х			Х		Х	Х	Х

Common Principles of Sustainability in Policies and Declarations

Table 2: (Wright, 2002, p. 11)

Pursehouse, 2012; Cellini et al., 2008; Thompson & Creighton, 2007; Velazquez et al., 2006; Wals & Jickling, 2002). This is because, according to Wals & Jickling (2002), "Talking about sustainability is quite different from making it the end, or aim, of education, or using it as the preeminent organizing concept" (p. 223). Thompson & Creighton (2007) argue that the closer the connection between the mission statement, the academic material, and the institution's commitment to sustainability, the more effective that institution will be at creating opportunities for solving sustainability issues.

Along with this focus on environmental literacy and sustainability education, much literature points to higher education's duty to use their physical spaces as "living laboratories" for the development of sustainable physical operations (Pursehouse, 2012; Eagan et al., 2008; Davies et al., 2003; Wright, 2002). Many IHEs resemble and operate like towns or cities, due to their scale, environmental impact, and financial capacities (Cellini et al., 2008; Eagan et al., 2008). Eagan et al. (2008) argue, "Given their research focus, educational mission and intellectual leadership in society, there may be no better setting to model sustainability and implement global warming solutions" (p. 8). While IHEs emphasize their presence as intellectual spaces, it is important to remember that they are physical spaces with significant infrastructure, and often serve as communities within communities.

Because campuses exists as not only learning spaces but also as community spaces, it is crucial that IHEs create and maintain positive relationships with local, regional, and even global communities. A common theme found in the literature was the need for IHEs to integrate with the wider community (Krizek et al., 2012; Pursehouse, 2012; Sibbel, 2009; Rappaport, 2008; Velazquez et al., 2006). In this way, sustainability can be actualized both within and outside of the institution. IHEs play an important role in and have both positive and negative impacts on the outside community. Indeed, Rappaport (2008) speaks about how greening can bring about important benefits to the broader community. While the literature speaks about the impact IHEs have in local, regional, and global spheres, it lacks significant data on how these broader communities impact the institution in return.

Beyond working with outside communities, the community within the institution must be strengthened. One of the most common points made is that in order to successfully incorporate sustainability into the institutional culture, students, faculty and staff

must practice open collaboration (Brown & Hamburger, 2012; Krizek et al., 2012; Pursehouse, 2012; Brinkhurst et al., 2011; Sibbel, 2009; Cellini et al., 2008; Eagan et al., 2008; Rappaport, 2008; Thompson & Creighton, 2007; Cortese, 2003). More so, each group fills a unique and necessary role in the drive for sustainability. Usually, students have the energy, motivation, and grassroots networking abilities needed to propel change. The faculty provide a bank of information and institutional knowledge, while staff provides the governing and operational tools to make sustainability a realization (Brown & Hamburger, 2012; Brinkhurst et al., 2011; Cellini et al., 2008).

Current research provides a comprehensive analysis of why sustainability should be a priority for higher education, how it can be achieved, and the challenges faced. Initially, there was a deficit of information about how sustainability scholarly initiatives affect admission rates and school reputations, but in the past decade, this has changed as the movement gains traction. This increase in the literature corresponds with what Sharp (2009) describes as a second wave of campus sustainability movements, which saw more sustained progress as opposed to the mere introduction of single projects. Therefore, these gaps can perhaps be attributed to the relatively short time frame that higher education has been actively pursuing sustainability. As such, there are very few long-term studies and case analyses available.

Overall, much of the literature pushes IHEs to go beyond textbook definitions of sustainability and towards an approach that is fully integrated into all values. disciplines, campus operations, and communities. The many sustainability declarations and rating scales that have appeared since the 1990s are a testament to the fact that IHEs are recognizing the benefits of "going green," and have responded with creative and innovative approaches. The following sections provide examples of these initiatives, as well as present some of the benefits and challenges associated with sustainability programs.

Creating a Sustainable Campus: Benefits and Challenges

There is now widespread consensus that "greening" the college campus results in numerous benefits for a campus community. As numerous institutions have discovered through their attempts at implementing such sustainable programs, approaches must be tailored to individual campuses. However, programs are successfully accomplished, when institutions can experience a diverse range of benefits and positive impacts such as economic gain, improved standing among peer institutions, and greater appeal to prospective students and faculty (University of California Berkeley, 2013; Brown & Hamburger, 2012; Krizek et al., 2012; McFarlane & Agueda, 2011; Sibbel, 2009; Bacher, 2008; Carlson, 2006; Barlett & Chase, 2004).

Resource conservation is the most apparent area in which economic gains for sustainable initiatives are realized (Krizek et al., 2012). In particular, "energy conservation measures have a direct, measurable impact on reducing campus operating costs, while reducing the campus carbon footprint" (Bacher, 2008, p. 25). IHEs may be rewarded for implementing practices to reduce consumption, especially resource energy-saving measures, by experiencing economic savings beyond their expectations. As Crowley (2009, p. 38) states, "Harvard University, for example, has demonstrated a consistent return on investment from its energy and resource conservation projects of more than 30 percent." Similarly, the University of California Berkeley (2013) noted in their Sustainability Report that "since the launch of Energy Management initiative (EMI) in 2012, the project has achieved savings of \$2.0 million surpassing our planning estimates - and has done so while remaining 12% under budget" (p. 7). Additionally, they stated, "Responding to reports from building occupants on variances in electricity use seen on the dashboards yielded savings of \$45,000 (Barrows Hall), \$2,000 (Evans Hall), and \$25,000 (Tolman Hall)" (p. 22). Other resource conservation efforts similarly prove cost efficient, such as a water conservation

initiative at the University of Massachusetts, where "as a part of its integrated sciences building at Amherst, [it] incorporated an underground 20,000 gallon storage tank that collects water from roofs and the underground foundation drainage system" and that "for the cost of a tank and a pump, the university has reduced long-term water supply cost and the potential strain on campus storm water systems" (Bacher, 2008, p. 27). Such energy-saving practices are not, however, the only ones to result in economic gain. Harvard University also instituted a revolving fund for sustainability projects in 2002, through which they have "invested more than \$12 million in projects since the loan fund's inception, and has maintained an estimated return on investment of 25 to 30 percent" (Crowley, 2009, p. 38). Furthermore, at Indiana University, "after the first year of operation, the Office of Sustainability demonstrated a 200 percent annual return on investment" and "its funding was incorporated as a line item in the campus budget" (Brown & Hamburger, 2012, p. 91).

In addition to the economic incentives for IHEs implementing sustainable initiatives, there also exists the potential for gain in social currency. Embracing sustainable practices on their campuses allows IHEs to improve their reputation in relation to their peers, and it has been shown that, "over a relatively short term, perceived 'green' campuses differentiate themselves from their competitors" (Krizek et al., 2012, p. 31). This differentiation can be essential in efforts to attract not only prospective students, but also distinguished faculty. The high ranking of an IHE on national sustainability lists or surveys can be a serious point of distinction amongst competitors. "Although there is strong resistance to participation in these surveys [about university sustainability], their results have significant effects on universities' external relations." (Brown & Hamburger, 2012, p. 94). "Studies now show that upwards of two-thirds of prospective college freshman look at campus green rankings as a factor in college choice" (Krizek et al., 2012, p. 27). Furthermore, a recent Princeton Review "survey of college applicants and their parents noted that 66 percent of respondents

said they would value having information about a college's commitment to the environment. Moreover, of that cohort, 24 percent said such information would 'very much' impact their decision to apply to or attend the school'' (Brown & Hamburger, 2012, p. 86).

In addition to economic and appeal-based benefits, a university's dedication to sustainable practices can result in positive experiences for the campus itself. For example, "sustainability groups can demonstrate the academic value of holistic linkages between research and education across disciplinary boundaries" (Brown & Hamburger, 2012, p. 85-86). Between such linkages and the physical manifestations of sustainable measures (such as improved resource management and sustainable construction), the potential exists for a lasting change to campus culture. In other words, "sustainability fosters a stable environment...because it enables an organization to establish a culture of stable innovation and transformation across the campus" (Sharp, 2009, p. 1).

Despite the immense success and overarching benefits experienced by many IHEs, their efforts have also revealed several obstacles that institutions face in implementing sustainability initiatives. Accounting for these may help other institutions think proactively and take measures to circumvent such challenges. Analyses of these efforts have tended to discuss challenges that fall into four interconnected categories revolving around barriers within the institution itself, monetary issues, obstacles within the leadership, and various psychological barriers (Brown & Hamburger, 2012).

Institutional barriers include impediments such and the competition and lack of as inertia communication between departments. The resistance to change and/or lack of commitment restricts the initial stages and thus, the growth of sustainable practices. Like all large organizations, IHEs are compartmentalized into different educational logistical offices. disciplines, staff and and administration. These different campus constituencies often see and are affected by sustainability efforts in different ways (Barlett & Chase, 2013; Sharp, 2009). As Sharp (2009, p. 1) argues:

The separation of different disciplines, arenas of responsibility, and tiers of management generally prevent people from understanding the broader context or the overall systems that operate across the institution. The fact that few individuals understand the broader institutional context, its systems and behaviors, has dire consequences for our efforts to navigate toward sustainability. This is because the demands of sustainability are system-wide and involve changing organizational culture, behaviors and the entire institutional context.

When disparate groups are suddenly asked to cooperate, they may be resistant to changing behaviors or feel a sense of competition. In some cases, less pressing issues such as aesthetics have appeared more insurmountable than they actually are. Additionally, the stratification of the institution's structure may hinder the introduction of sustainability. Further hindrances lie in the lack of funding or the unwillingness of certain campus sectors to front initial costs. On the other hand, assumptions about the overall cost, initial investment, and the return on investment of sustainability programs can lead to inconsistent funding and personnel support.

Another barrier is the lack of initiative and leadership over the long term. This could be in part due to the worry of burnout and lack of commitment (Barlett & Chase, 2004). Because it is sometimes difficult to build rapport for sustainable efforts early on, this alone could potentially lead some to believe that certain sustainable efforts are destined to fail. As a result, it is imperative to reduce lofty expectations and scale back immediate goals, delegate appropriate responsibility across offices, and "replenish depleted enthusiasm by attending environmental science/studies conferences" (Barlett & Chase, 2004, p. 49). At these conferences, both sustainable leaders and learners can take part in networking with like-minded individuals and can then become inspired by others who have experienced the same setbacks and learn how they overcame them.

In short, the sustainable lens is not only for academic institutions, but also individuals and organizations at large; it serves as a better means of understanding the world and how our actions influence the environment, campus finances, and social relationships on campus as well as with neighboring communities. As Carlson (2006) argues, "The view that environmental and economic issues are competing interests is old thinking...the strategies that we have used to get where we are today have had such negative social, economic, and environmental side effects that we need a new lens" (p. 8). With this perspective in mind, the following section explores some of the more common curricular and administrative reforms, infrastructure initiatives, and civic engagement projects that IHEs are implementing throughout North America.

Common Sustainability Initiatives at North American IHEs

The incorporation of sustainable thinking into all aspects of the functioning of IHEs is a necessity in order to successfully cope with and combat contemporary global struggles. The following categories are especially important in this regard: Administrative, Personnel, and Curricular Reforms; Infrastructure Projects; Green Funds; and Civic Engagement Initiatives.

Administrative, Personnel, and Curricular Reforms

There are many ways to institutionalize sustainability, such as through formal statements, the creation of new offices, the formation of committees, and the adjustment of curriculum plans. In an effort to institutionalize a campus-wide sustainability perspective, IHEs are incorporating the language of environmental sustainability, social justice, and civic engagement into their mission statements and core values. For example, Ball State University has a statement relevant to sustainability in its University Strategic Plan (Wright, 2002). Additionally, the University of South Carolina, the University of Buffalo, the University of Toronto, and George Washington University are examples of institutions who have incorporated a sustainability statement into their mission statement or campus policies (Thompson & Creighton, 2007; Wright, 2002).

As a means to fulfill new sustainable missions, values, and policies, some IHEs create an office of sustainability. These offices can be useful because they serve as a direct means for addressing questions, issues, and new ideas. More so, an office of sustainability can connect with and assist a variety of groups both on and campus. Ultimately, campus off sustainability operations operate best with a diverse group of stakeholders, so the advocacy provided by an office of sustainability may become less relevant over time as sustainability becomes intrinsic to the institution as a whole (Brown & Hamburger, 2012, p. 85-87). Still, the creation of such an office appears to be instrumental in the beginning phases.

Campuses both with and without offices of sustainability work to achieve sustainability goals through sustainability committees or officers. Velazquez et al. (2006) state, "The committee does not take over the initiatives around the campus, it helps people responsible of those initiatives by disseminating and receiving information, coordinating initiatives, avoiding overlapping efforts, obtaining funds, and ensuring that policies are effectively implemented" (p. 5). In their model, the sustainability committee is necessary for the creation and implementation of new, greener campus policies. Ideally, some of the policies will lead to changes in how curriculum is delivered across disciplines.

Increasingly, IHEs are finding ways to sustainability perspectives incorporate into the curriculum in an effort to educate students about environmental issues. Reforming the curriculum is a fundamental starting point for enacting change on campus, because the curricula is built on certain assumptions. As Cortese (2003) notes, much of the contemporary curricula still suggests that "humans are the dominant species and separate from the rest of nature," that "resources are free and inexhaustible," and that "individual success is independent of the health

and well-being of communities, cultures, and the life support system" (p. 16-17). At Southwestern this could be addressed through the integrative Paideia/Cluster program, which could incorporate sustainable activism if framed appropriately. There are several examples of practices that successfully implement Cortese's four areas of a fully integrated higher education systemeducation, research, university operations, and the Examples external community. include: the development of faculty and academic programs in all majors with the context of sustainability; the incorporation of sustainable design in curricula; the creation of a curriculum that involves the improvement of local communities and resources; and the inclusion or expansion of sustainability in architectural education (Cortese, 2003, p. 19-21).

In addition to the scope of sustainability education, it is important to note that timing is also a factor. Many initiatives highlighted by Messineo (2012) suggest the need to begin sustainability education early in the college career. This includes providing living spaces that are sustainably constructed and facilitate understanding of issues related to sustainability. Firstyear programs, including seminars, book programs, and student orientation, should set the bar for incorporating sustainability in curricula (p. 74-78). The success of first-year programs in sustainability education is aided by combining experiences in the living space, the classroom, and the community (p. 79-80). Regardless of the approach taken by a particular program, the emphasis should be on creating lifelong learners and engaged citizens who can then affect campus culture and support institutional values (p. 79-80).

Infrastructure Projects

One of the most common strategies employed by IHEs is the incorporation of sustainability principles into the physical infrastructure and energy usage of the campus. According to Rappaport (2008), hundreds of IHEs have made a climate commitment, which means they will strive to lower their emissions of greenhouse gases. This is an important point, considering

that IHEs in the United States spend an estimated \$2 billion per year on energy (Rappaport, 2008). Many campuses address this challenge through building renovations such as "adding insulation, installing efficient windows, and upgrading the boiler" (Rappaport, 2008, p. 8). Renovating buildings is an important task, especially considering that upwards of 90 percent of direct greenhouse gas emissions may come from buildings (Bacher, 2008, p. 25). Emory University, the University of Tennessee at Knoxville, Warren Wilson College, and other IHEs are working on constructing efficient buildings and attaining Leadership & Environmental Design (LEED) Energy in certification when new development is necessary (Rappaport, 2008, p. 10).

Beyond complete renovations and new buildings, IHEs can also practice inexpensive, costeffective building improvements, such as switching light bulbs to compact fluorescents (Bacher, 2008, p. 26). When Tufts University upgraded lighting in 14 buildings and parts of buildings, they yielded an annual savings of more than \$90,000 (Rappaport, 2008, p. 10). These lighting upgrades included "efficient lamps, sophisticated controls and occupancy sensors" (Rappaport, 2008, p. 10). Electricity usage can also be reduced by using combined heat and power systems in their buildings-a method that can reduce greenhouse gas emissions and the carbon footprint of the institution. Over 140 IHEs are using combined heat and power systems (Rappaport, 2008, p. 11).

Improving campus buildings extends into the housing infrastructure as well. The provision of green housing options is important for IHEs, because campus housing is where students are centralized and it has the potential to have a substantial impact on the institution's overall sustainability goals. Antonini and Dunkel (2009) assert that a strong majority of green campus housing is currently seeking or has already achieved LEED certification. Pursehouse (2012) outlines some sustainability implementations within housing, including switching to environmentally friendly cleaning supplies and upgrading to Energy Star appliances, low-flow toilets, and low-flow showerheads. In order to engage the students, many institutions offer sustainability-themed housing options, and Oberlin College even has students participate in a residence hall based energy-savings competition (Pursehouse, 2012, p. 50). The residential aspect is also important to an IHE's sustainability goals because it has the ability to educate "students in learning how to participate in and utilize facility-related processes like composting and recycling" (Pursehouse, 2012, p. 47).

Waste reduction is also an important area of focus for many IHEs. According to Rappaport (2008), the College of the Atlantic held a waste-free graduation that was featured in the New York Times. Because waste has a tremendous impact on the present and future environment, it is an area that needs much attention. An institution that drastically lowers its waste has the potential to attract a lot of attention, as mentioned above. In their research, Largo-Wight et al. (2013) state, "Approximately 90% of waste generated in the U.S. could be recycled, but Americans are recycling only about 20% of their trash" (p. 27). They tested perceived behavioral control and performed a recycling intervention on a college campus in order to find out if the convenience of recycling receptacles has an effect on recycling. Their study concluded that educating and promoting a recycling program has no effect on the amount of recycling, but adding more receptacles to campus, specifically paired with indoor waste bins, increased the volume of recycled material significantly. Other than recycling, composting is also a common sustainable strategy, especially when related to campus gardens and local food systems.

Campus gardening and cooperatives between gardens and dining services have become hot trends for IHEs. According to Horan (2010), Colorado College is one of many institutions that has dedicated itself to supporting local farmers and has taken this even a step further. In partnership with their food service provider, *Bon Appetit*, they have made student farming education a priority. A student-run garden gives its produce to the campus dining center, while also incorporating an educational component to teach students the logistics of being a farmer, as well as employing interns to maintain the garden during the summer. Pursehouse (2012) looks at the top eight schools that received "A" grades in the 2011 *College Sustainability Report Card* and points out some very ambitious sustainability initiatives focused on dining. These include Dickinson College spending 50 percent of its food budget on local and organic products, Brown University composting 100 percent of its postconsumer food products, and Pomona College serving 100 percent hormone-free milk (Pursehouse, 2012, p. 49).

Green Funds

All of the above sustainability efforts represent physical improvements to campuses that would never have occurred without the existence of successful policies to fund and support green projects. As IHEs are looking to improve sustainability on campus, they are running into funding-related issues for proposed initiatives. One approach to funding that is quickly becoming prevalent among these institutions is the establishment of a campus green fund (CGF) (Beverage et al., n.d.). A CGF is essentially a budget or an account with funds to be put specifically toward the implementation of sustainability initiatives. Students, faculty, staff, and/or administrators can use this money to fund initiatives in areas such as "sustainable education, research, operations, planning, administration, and engagement" (Beverage et al., n.d., p. 4), year after year. Currently, there are at least 136 IHEs that have some type of CGF (AASHE, 2013).

Depending on the needs of the institution, there are many ways to approach a CGF. One type of CGF that has gained a lot of attention is the Green Revolving Fund (GRF). This type of CGF focuses on financing projects that reduce costs—for example, energy efficiency, renewable energy, and resource/material reduction projects—and includes an investment structure that cycles money back into the fund over time (Indvik et al., 2013; Flynn et al., 2012). The savings generated by the implementation of these projects is tracked and the money saved is directed back into the GRF to finance future projects (Indvik et al., 2013). Due to the GRF's proven effectiveness at promoting sustainability while simultaneously reducing costs and its immense potential for increasing funding for sustainability initiatives, there are a growing number of institutions adopting this model (Flynn et al., 2012). Flynn et al. (2012) state that between 2008 and 2012, the number of institutions with a GRF rose by 550 percent (see Figure 1). Additionally, GRFs are becoming especially popular with smaller institutions (see Figure 2); perhaps due to these institutions' limited financial capabilities.

Growth of Green Revolving Funds: 1980–2012



Figure 1: (Flynn et al., 2012, p. 12)



Distribution of Green Revolving Fund Institutions by Enrollment Size

Nationwide, CGFs are collected and administered with student oversight at more than fifty IHEs, including Harvard University (\$5/semester), Goucher College, Sewanee: The University of the South, the College of William and Mary (\$30/semester), and Lewis and Clark College. There are a range of fees, and most are allocated to student-driven activities and projects that promote sustainability on campus (Barlett & Chase, 2013). In some cases, such as at Lewis and Clark College, a percentage is placed into a rainy day reserve for any major endeavors that the school may like to go forth with in the future. The CGFs at Lewis and Clark College and Hendrix College are overseen by designated committees that analyze the status of the surplus funds and approve fund expenditures, including the awarding of grants to support green and sustainable efforts (Lewis and Clark College, 2013). Surplus money was used to purchase renewable energy certificates for the Green Power Initiative during academic years.

Institutions with established CGFs are inspiring other IHEs to follow suit. Both Davidson College and St. Edward's University are in the process of establishing CGFs and are working on getting the support needed from the campus community. St. Edward's is modeling their CGF off The Green Initiative Fund (TGIF) at the University of California at Santa Barbara (UCSB) (University of California Santa Barbara, 2013). UCSB students voted for TGIF in 2006, which added \$2.60 to their semester tuition and gave UCSB an additional \$182,000 for green projects on the campus (University of California Santa Barbara, 2013). Schools participating in CGFs say that initiating the fund has been one of the most expedient ways their campuses have shown dedication to social responsibility, made a difference in the world, and cemented their reputation amongst peers (Davidson College, 2013). While the basic aspects and steps to implement a CGF are consistent among IHEs, a report published by the Sustainable Endowments Institute and AASHE states that "perhaps the most powerful attribute of the GRF model is that each of its components can be adapted to the unique challenges,

goals, and opportunities of your institution," (Indvik et al., 2013, p. 9).

Civic Engagement Initiatives

Civic engagement is a key component of a successful sustainability commitment (Brown & Hamburger, 2012; Dunn & Hart-Steffes, 2012; Alshuwaikhat & Abubakar, 2008; Cellini et al., 2008). Through their work with the wider community, students learn connections between curriculum and practical application, while simultaneously fulfilling their institution's responsibility as a community leader. A guiding principle for most environmentalists is interdependence, and "a truly sustainable campus cannot exist in isolation from its interdependent community" (Brown & Hamburger, 2012, p. 92). The viability of any sustainability initiative dependent upon integrated is an approach (Alshuwaikhat & Abubakar, 2008). Therefore, it is crucial that students have the ability and opportunity to apply sustainability concepts in a hands-on and practical way. Civic engagement is one vital avenue through which students can accomplish this while bringing about positive environmental and social change to the community.

Performing projects within the local community and spreading awareness and knowledge about sustainability issues is an important way IHEs can demonstrate their initiatives to the wider community. Towson University, California State University Chico, and University of Miami are just a few examples of institutions engaging the community by addressing environmental needs, raising awareness, and working to improve sustainability within their local communities (Towson University, 2014; University of Miami, 2014; California State University Chico, 2010). IHEs may also use community outreach to influence younger students and invest in the future generation. For example, Carleton College has a Kids for Conservation program in which students travel to local elementary schools and share knowledge in environmental education (Carleton College, 2014). While civic engagement may not be as obvious to observe at IHEs, it remains an

important part of committing to sustainability initiatives (Brown & Hamburger, 2012; Dunn & Hart-Steffes, 2012; Alshuwaikhat & Abubakar, 2008; Cellini et al., 2008).

How Does Southwestern Measure up to Other Institutions?

As illustrated throughout this literature review, it is evident that there is a growing trend among IHEs to begin work on new sustainability initiatives while simultaneously making sustainability a priority for their institutions. These IHEs include some of Southwestern's peer institutions. Southwestern University is a member of the Associated Colleges of the South (ACS), a consortium of sixteen distinguished and nationally recognized liberal arts colleges spanning across twelve different southern states. Additionally, Southwestern is also considered to be a peer to forty one colleges, such as Dickinson College, Vassar College, and Claremont McKenna College, by the Carnegie Commission on Higher Education based on similar characteristics such as size, private versus public, and admission rates (Southwestern University, 2014). These institutions set standards for sustainability for IHEs in general and Southwestern in particular. Part of this report will continue to demonstrate Southwestern's reputation in sustainability as compared to its neighboring institutions.

Some of our neighboring institutions that are already members of AASHE include Austin College, Austin Community College, Baylor University, Rice University, Southern Methodist University, St. Edward's University, Texas A&M, Texas State, Texas Tech, Trinity University, University of Texas at Austin, University of Texas at Dallas, University of Texas at San Antonio, and Northwest Vista College (AASHE, 2013). Additionally, nine ACS institutions are members of AASHE, 90 percent have signed the ACUPCC, and nine ACS institutions have sustainability pledges that have demonstrated an increase in student interest towards sustainability (AASHE, 2013). While looking to other peer institutions in the ACS, it is made apparent that many schools are putting sustainability on the forefront of their institutional agendas. The word sustainability is either on the homepage of the institution, or has a substantial and interactive website run by the office of sustainability, where one could easily learn about how to become more sustainable at the university, and what initiatives are being put into place (Barlett & Chase, 2008). While Southwestern University has a sustainability web page, it is not as easily accessible nor is it as interactive as those at peer institutions.

Regionally, Southwestern is surrounded by schools that are putting sustainability at the top of their academic agendas. Rice University, Trinity University, University of Texas, and St. Edward's University all either have a green fee or are working towards implementing one in the near future. Trinity and Rice have also made waste management a priority by installing compost stations in the cafeteria areas and making recycling easier around the campus. The University of Texas has begun to actively manage their carbon footprint by educating students about what they can do to be more sustainable. In fact, they are giving away reusable shopping bags for students to use in the campus bookstore and around campus in an effort to improve students' education on sustainability (University of Texas, 2013). Both Rice and Trinity have made a point to incorporate only native and noninvasive species on their campus to better manage their water usage. Also, the University of Texas at San Antonio has a sustainability council composed of campus faculty, staff, students, and alumni who meet to discuss what the university can do to foster a "green" environment (University of Texas at San Antonio, 2013).

Given Southwestern University's previous and current progress towards sustainability, it is poised to emerge as a leader in sustainability among its peer institutions. Many of the schools, such as Birmingham-Southern College and Davidson College, have buildings which are LEED certified, community gardens, and waste management systems very similar to ours, but many also have offices of sustainability maintaining and funding those programs (ACS, 2014). The majority of Southwestern's sustainability initiatives have been student driven and are usually funded by grants.

Seemingly, one of the main differences between Southwestern's sustainability tactics and the tactics of our peer institutions is that they incorporate sustainability broadly within daily life. From having a sustainability pledge posted around campus to having white roofs, pervious parking pavements, and rain gardens, it is apparent that these institutions are attempting to "live green." Additionally, other small liberal-arts colleges such as Davidson College and Claremont McKenna College have begun to teach sustainability by making it an integrated part of the way students live and learn (ACS, 2014).

Southwestern has independent many sustainability initiatives, but could benefit from a more systematic approach. Posner and Stuart address the technical aspects of mapping out a campus-wide systemic structure, which can serve as an important tool for locating where students can leverage sustainability efforts. They cited a campaign at the University of Vermont that focused on eliminating bottled water on its campus, and this is similar to the ongoing efforts of Students for Environmental Action and Knowledge (SEAK) to do the same at Southwestern. Additionally, incorporating sustainability into an institution's governance can provide guidance when making institution-wide decisions. Santa Clara is one such institution to have policy measures in place for handling sustainability issues concerning construction, and these have proven to expedite the green building process by establishing an official stance on the issue (McClure, 2011). This example could be extended further into a university's curriculum, extracurricular sustainability intersections, as well as its student community interactions.

Southwestern may be lacking in some sectors of sustainable achievements--such as transportation efforts, curriculum integration, campus-wide sustainability consciousness, marketing itself as a sustainable college, etc. However, it stands out in others--such as LEED certified construction efforts, ongoing commitment to clean energy, strong sense of community activism, and collaboration between dedicated professors and passionate students. As the Environmental Studies capstone class continues to research and incorporate the ideas presented by the alternative sustainability models of various IHEs, the focus on what needs to be done and what can be done will become more apparent.

MEASURES:

In 2009, Southwestern University signed the ACUPCC, and this February (2014), Southwestern became a of AASHE. member Membership in these organizations demonstrates Southwestern's commitment to campus sustainability. ACUPCC requires and AASHE encourages member institutions to measure their environmental impact. In 2011, in conjunction with Sodexo, Southwestern completed a carbon footprint analysis that created a greenhouse gas (GHG) emissions profile. While this information is useful, the breadth of the analysis was limited. To continue working toward increased sustainability, determine which areas are in the greatest need of improvement, and track progress, Southwestern would benefit greatly from а more detailed and multidimensional measurement of its environmental impact. As a member of AASHE, Southwestern now has access to the Sustainability Tracking, Assessment & Rating System (STARS) program. The Environmental Studies capstone class plans to use the STARS program, with the help and cooperation of a number of academic and administrative departments, organizations, and campus community members, in order to calculate Southwestern's ecological footprint.

Through STARS, Southwestern's sustainability initiatives will be enhanced by moving beyond the three scopes used to calculate GHG emissions. The three scopes are a classification system used to identify different types of carbon emissions. While the three scopes cover numerous categories, they are only applicable for determining carbon footprint.

According to the GHG Protocol (2012), the three scopes are as follows (see Appendix A for more detail):

- Scope 1: Direct Emissions
- Scope 2: Imported Emissions
- Scope 3: Indirect Emissions

Using these three scopes, companies, organizations, and institutions can determine their carbon footprint using the same type of data. While the interpretation and scoring may be different between carbon footprint calculators, those that used the three scopes can easily transfer their data to a single method of analysis, leading to a more reliable and accurate comparison between different institutions.

The greatest difference between STARS and a GHG emissions calculation is that STARS moves beyond one-dimensional measures of carbon to include other dimensions of an ecological footprint. While a carbon analysis is most reflective of the physical operations of a university, an ecological footprint incorporates economic, environmental, and sociocultural aspects of sustainability into its analysis. The approach required to determine an ecological footprint is much more holistic and better aligns with Southwestern's emphasis on interdisciplinary learning. It will also provide a comprehensive record of Southwestern's sustainability initiatives that are easy to interpret, facilitate comparison with similar institutions, link Southwestern's local and global impacts, and allow for exploration of the relationship between different types of environmental impacts (EPA, 2013).

Explanation of STARS Rating System Sections

Beyond the measurement of GHG emissions by the three standard scopes, several other aspects of campus are often considered when expanding a carbon footprint analysis into an ecological footprint analysis. When utilizing the STARS sustainability rating, these expanded campus elements fall into the main categories of academics, engagement, operations, planning and administration, and innovation. These categories are subdivided to include the following assessment criteria: sustainability in the curriculum; academic research about sustainability; opportunities for campus engagement with sustainability; public engagement; dining services; sustainable grounds; purchasing; waste; water; coordination; planning and governance; diversity and affordability; health, wellbeing, and work; investments; and innovation (see Appendix B for more detail). Furthermore, the STARS calculations also take a more detailed look at the different aspects of GHGs, breaking down several aspects of the three scopes into separate categories such as air and climate, energy, buildings, and transportation.

Relevant Contacts

For each of these four broad themes the following are resources and contacts at Southwestern that would assist in gathering the data required for the STARS assessment. In addition to these resources and contacts, further information may be gained through university office websites, university listservs, or university publications.

Academics

- The Academic Course Catalog
- Environmental studies department
 - Dr. Laura Hobgood-Oster (Department Co-Chair)
 - o Dr. Romi Burks (Department Co-Chair)
 - o Dr. Joshua Long
 - o Students
- The Talloires committee
- Geographic Information Systems (GIS) instructor: Anwar Sounny-Slitine
- Other University Departments and Faculty

Engagement

 Office of Civic Engagement (OCE): Dr. Sarah Brackman

- Director of Civic Engagement: Abby Morales
- Office of Admissions
- Office of Student Activities and individual student organizations
- Student workers
- Vice President of Student Life: Jerry Brody
- Assistant Director of Student Activities: Jason
 Chapman
- Interim Director of Student Activities and the Assistant Dean of Student Life: Derek Timourian
- Residence Life: Jaime Woody (Dean of Students, Director of Residence Life, and the Associate Vice President)
- Director of News and Media Relations: Ellen Davis
- Sodexo: Chris Peterson
- Food Advisory Board
- GIS Instructor: Anwar Sounny-Slitine
- Physical Plant
- Associate Vice President for Facilities and Campus Services: Bob Mathis

Operations

- Office Facilities and Campus Services
 - o Bob Mathis
 - Physical Plant: Joe LaPaige
- Sodexo: Chris Peterson
- Student Researchers: Adrienne Dodd, Jesse Chu

Planning & Administration

- The Board of Trustees
- Provost: Jim Hunt
- The Talloires Committee
- Physical Plant
- Sodexo
- CommonFund (manages the University's endowment)
- The Committee for Diversity Education (Diversity Enrichment Committee).
- The Human Resources Office
- Admissions

Summary of AASHE Benefits

With membership, we now have full access to the AASHE resource center, which includes a wealth of information and is divided into the following categories:

- General Resources for Campus Sustainability
- Education & Research Resources
- Campus Operations Resources, Planning
- Administration and Engagement Resources
- AASHE Publications
- AASHE Awards
- International Resources and STARS

Some examples of documents relevant to current Southwestern initiatives include: A Guide to Developing Sustainable Food Purchasing Policy, Campus Composting Programs, Campus Bottled Water Campaigns and Reduction Plans, and Campus Case Studies on Green Building. There are many other useful documents, including the Biannual Higher Education Sustainability Staffing Survey, which provides an overview of what other institutions have in place in terms of staff positions that specifically address issues of campus sustainability and the various roles covered by such a position. Additionally, AASHE creates a weekly bulletin that highlights exceptional university projects and initiatives that fall under various categories of sustainability. It also releases the greenhouse gas inventories of several universities including the methodology/calculation model employed. Finally, as part of the AASHE community, Southwestern now has access to the discussion forum where we have the unique opportunity to circulate ideas and ask questions of other AASHE members who have been involved in similar projects and data collection.

Beyond access to valuable documents and a professional network, one of the greatest benefits of memberships will be utilization of the STARS rating system. Currently, 621 IHEs have membership with AASHE, and all of these institutions use STARS

to calculate an eco-footprint. AASHE membership now allows Southwestern to be rated on the same scale as many of their peer institutions, internationally, nationally, and regionally.

AASHE does more than simply connect IHEs to one another; it also connects IHEs to business partners who practice sustainability. Their business directory allows members to pick a service by category (e.g.: books, food and dining, transportation) and browse reputable company profiles. In this way, AASHE promotes sustainability in all areas of campus and gives members the tools to advance their goals.

The resources available as members of AASHE align with many current student, faculty and staff sustainability projects and goals. AASHE's education and research resources provide information on and examples of aligning curriculum with sustainable initiatives. At Southwestern, the theme of sustainability coincides with the majority of all academic departments. For instance, examples of current courses cross listed as Environmental Studies include: Global Environmental Justice (anthropology), Environmental Communication (communications studies) Energy and the Environment (physics), Introduction to Earth Science (physics), Philosophy of the Environment (philosophy), History of American Technology (history), Environmental History of the Ancient World (history), Unnatural Disasters (history), Religion and Sustainable Agriculture (religion), Animals and Religion (religion), Theater Sustainability (theater), Landscape and Conservation (biology), German Culture (German), etc. The Quality Enhancement Plan recently restructured Southwestern's unique Paideia agenda to become all-encompassing and more interdisciplinary in future years. Thus, the time is ripe to introduce sustainability as a key component to this integrative model. Access to the documents will help guide these projects and goals while also offering a second opinion.

At an individual level, students conducting traditional and field research will benefit from access to the data AASHE membership exclusively provides (i.e. research on civic engagement, economic trends in sustainability, etc). Such research is often in collaboration with an academic advisor. Utilizing AASHE in the course of collecting information and generating hypotheses that align with sustainability furthers student/professor exposure to the resources Southwestern now has. In sum, all areas of campus life stand to benefit through AASHE membership.

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Scope 1: Direct GHG Emissions

From sources owned or controlled by the organization

- · Consumption of fuels in vehicles and equipment
- Combustion emissions from boilers, furnaces, space conditioning, water heating, production eating
- Intentional or unintentional leakage of refrigerants and other GHGs (fugitive emissions)
- Chemical emissions in production or controlled processes
- Release of GHGs from livestock, crop husbandry, and groundskeeping

Scope 2: Imported Emissions

From purchase of power from sources not owned or controlled by organization

- Purchased electricity
- Purchased steam, hot water, chilled water, or similar production uses
- Emissions occur at the facility where power is generated

Scope 3: Indirect Emissions

From operational influence of the organization, from sources not owned or controlled (an optional reporting category for all other indirect emissions)

- Air and business travel
- Employee, student, tenant, and user commuting
- Event and lifestyle activities
- Waste stream management
- Extraction, production, and transport of purchased materials
- Purchase and consumption of foods and food commodities
- Transportation of purchased fuels
- Outsourced contractors, contractor owned vehicles, charter vehicles
- Line or piping losses from electricity or plant transmission and distribution
- Offsets and sequestration

Appendix B:

ACADEMICS

Curriculum:

This category offers a potential 40 points toward the overall rating, and analyzes the emphasis given to sustainability in learning outcomes at the institutional or program level, and whether courses that are offered are either listed as sustainability courses or discuss sustainability as a topic. The category also considers the presence of undergraduate or graduate programs focused on sustainability, of immersive internship or study-abroad experiences focused on sustainability, and of incentives for faculty to develop courses dealing with sustainability. Finally, it looks at whether the institution conducts sustainability literacy assessments of its students and whether the institution "utilizes its infrastructure and operations as living environments for multidisciplinary learning, applied research and practical work to advance campus sustainability" in any of fifteen listed categories.

Research:

The research conducted at the institution has the potential to add a further 18 points to the rating. This category analyzes primarily the percentage of faculty conducting research related to sustainability and of departments in which faculty are conducting such research. It also considers the institutional support or incentives to students and faculty conducting sustainability research, and whether the institution has an open access policy regarding such faculty research.

ENGAGEMENT

Campus Engagement:

Campus engagement offers a potential 20 points towards the overall rating, and includes the existence of for-credit student sustainability educator programs. Consideration is also given to whether the institution has sustainability focused activities as part of orientations as well as whether the institution provides sustainability outreach material to the campus, such as posted signs of their efforts or a consolidated sustainability website. Furthermore, the amount of cocurricular campus aspects with a sustainable focus such as active student groups, community gardens, lecture series, or student-run initiatives with sustainable practices are analyzed along with the presence of sustainable outreach campaigns. In addition, points may be earned based on the presence of faculty educator, inclusion of sustainability in new faculty orientation, and programs designed to train staff in sustainability.

Public Engagement:

A further 22 points are available to institutions based on their public engagement opportunities that advance sustainability. The opportunities considered include formal partnerships with community organizations, inter-college collaborations, continuing education programs for the community, and the institution's participation in public policy to advance sustainability. Other types of public engagement analyzed are community service hours of the institution's students, engagement of public stakeholders in the university's administrative and planning decisions, and the consideration of fair working conditions for the production of apparel with the university's logo. For universities affiliated with a hospital or healthcare network, the membership of that affiliate in one

of three sustainable healthcare networks is also considered.

OPERATIONS

Air and Climate:

This category considers the extent to which an institution emits greenhouse gases, reduces these emissions and the local air quality. Monitoring and reducing greenhouse emissions not only improves local health, but also helps reduce the effects of global climate change. STARS awards up to 11 points for this category based on inventorying greenhouse gas emissions and reducing net emissions of Scope 1 and Scope 2 (10 pts) and the preservation of local ecosystems and human health through minimizing pollution and protecting outdoor air quality (1 pt).

Buildings:

To assess the sustainability of a particular building several factors are considered. These involve the day-today operations and maintenance of a building (4 pts), design and the construction of the building (3 pts) and the indoor air quality (1 pt). As one of the largest users of energy buildings, both in their design and maintenance are a significant part of sustainability. Buildings contribute significant amounts of greenhouse gases and constantly use potable water. Through design and proper site identification significant energy savings can be gained. Furthermore by building and maintaining buildings in an efficient and environmentally safe manner a buildings impact on the surrounding environment can be mitigated. The potential benefits of this include both the conservation of resources, reduced waste and water consumption, improve indoor air quality and create green markets for environmentally beneficial materials and services.

Dining Services:

Beyond curriculum and engaging the student body, dining services are a large part of sustainability that provide a possible of 7 total points towards a STARS rating. The STARS system considers how IHEs use their food and beverage purchasing power to support local, sustainable, and humane products. It also considers whether the dining services of an IHE are low impact and offer "complete-protein vegan options".

Energy:

Through increased conservation and efficiency institutions can mitigate one of the largest sources of greenhouse gas emissions, energy consumption. Switching to alternative fuels can help reduce harmful pollutants such as sulfur dioxide, nitrous oxides, and various heavy metals. Furthermore, fossil fuel drilling has a significant negative impact on local environmental quality and ecosystem health. Using clean, renewable energy sources provides both relatively secure utility rates and a marked improvement in environmental quality. Energy is broken into two separate categories: building energy consumption (6 pts) and the use of clean and renewable energy (4 pts). Building energy consumption involves the reduction of total energy consumption compared to a calculated baseline, with the ultimate goal being less than 28 Btu per gross square foot. The second factor, clean energy, rewards institutions for using renewable resources such as wind, solar, geothermal etc. Whether these are produced locally or involve purchasing renewable electricity through a certified green power purchasing option an institution can receive credit for this category.

Grounds:

STARS offers a total of 3-4 possible points in its consideration of the grounds of an IHE. It specifically looks at landscape management (2 pts) and biodiversity (1-2 pts). Having a sustainable physical landscape is very important to measures of sustainability because it includes a large geographic area of the campus and serves as a site for numerous campus activities. To achieve sustainable landscaping, one of three systems are recommended and are widely used by IHEs: Integrated Pest Management (IPM), sustainable landscape management programs, or organic/certified/protected strategies.

Purchasing:

An IHE can earn up to 6 possible points for demonstrating sustainably responsible purchasing habits. The purchasing categories considered by the STARS rating system include electronics purchasing, cleaning products purchasing, office paper purchasing, inclusive and local purchasing, life cycle cost analysis, and guidelines for business partners. STARS emphasizes that IHEs have the opportunity to make an impact in the consumer goods industry by choosing to purchase more environmentally-friendly products. Cleaning and janitorial products should not contain harmful chemicals and should be considered "green" because they promote a healthy environment for the janitorial staff using them, as well as for the people who come in contact with the cleaned surfaces. Recycled or third party certified office products are also a way for IHEs to conserve water and energy, as well as save forests from destruction. There is also the opportunity to purchase goods locally to support the community and contribute to the local economy.

Transportation:

In scope, transportation can be seen as the most intricate and widespread form of greenhouse gas production. The institution's fleet of service vehicles (1 pt), student (2 pts) and teacher commutes (2 pts) and sustainable transportation supports (2 pts) all impact this category. By modeling sustainable transport, providing alternative forms of transportation and reducing petroleum dependency institutions can improve health and receive significant savings. Using cleaner fuels, replacing old inefficient vehicles or using mass transit to travel to and from the institution can all benefit local environmental quality. The percentage of students and employees which use viable renewable transport sources determines the general score of an institution. Furthermore, by offering programs to reduce commuting draws attention to this critical issue and this in turn reduces air pollution and the costs associated with travel.

Waste:

Many IHEs are moving towards zero-waste campuses, and this subcategory is achieved through reduction, reuse, recycling and composting strategies which can earn an IHE a total of 10 possible points towards its STARS rating. By minimizing waste, IHEs are doing their part to reduce greenhouse gas emissions, reduce water pollution, reduce landfill deposits, and save money on hauling fees. This section focuses on what is being done to minimize waste and divert waste.

Water:

A lot of water is used by IHEs, and the STARS system seeks to recognize those who are aiming on conserving this precious commodity and offers a total of 5-9 possible points in this subcategory. Managing water usage through conservation, recycling and reuse is one part of this section. Rainwater management is also an important aspect in this because it means that the IHE is doing its part to reduce stormwater runoff and minimize local water supply contamination. Wastewater management is the last section, it involves ecologically sound systems to naturally process wastewater as a more sustainable choice because it decreases pressure on the local infrastructure and minimizes contamination to local bodies of water.



PLANNING AND ADMINISTRATION

In order to assess the sustainability of the planning and administration of an IHE, the STARS system considers four categories: (1) coordination, planning, and governance, (2) diversity and affordability, (3) health, well-being, and work, and (4) investments. The subcategory, coordination, planning and governance, is further broken down into three reporting fields: sustainability coordination, sustainability planning, and governance. These fields offer a total of 8 possible points.

Coordination, Planning, and Governance:

This category considers the extent to which an IHE has institutionalized its sustainability mission and process. Measures of success in this subcategory include an active sustainability committee, office or coordinator, the adoption of formal plans for the advancement of sustainability within the IHE, and a governance system that includes the active participation of students, staff, and faculty.

Diversity and Affordability:

This category is broken down into five reporting fields, offering a total of 10 possible points in:

- Diversity and Equity Coordination
- Assessing Diversity and Equity
- Support for Underrepresented Groups
- Support for Future Faculty Diversity
- Affordability and Access

The purpose of this subcategory is to assess the extent to which an IHE includes economic and social factors in its sustainability mission through positions and programs that provide the grounds for collaboration among diverse groups centered on the advancement of diversity and affordability within the IHE. An IHE can earn points by having an active diversity and equity committee, office, or officer, by implementing a system that assesses the IHE's diversity and equity, by offering support systems for underrepresented groups along with a discrimination response policy, program or team, by building a diverse faculty, and by having programs that make the IHE accessible and affordable to low-income students and non-traditional students.

Health, Wellbeing, and Work:

This category considers the extent to which the IHE invests in its human resources programs and policies. This subcategory is further broken down into the following reporting fields: employee compensation, employee satisfaction, wellness programs; and workplace health and safety. An IHE can earn a total of 7 points from these fields by providing sustainable compensation to employees through the form of a "living wage" or allowance for collective bargaining, by regularly surveying their employees concerning their job satisfaction, opportunities for learning and advancement, and work culture, by providing wellness programs for students, staff, and faculty, and by working to reduce workplace injuries and occupational disease cases.

Investment:

This category is broken down into the reporting fields: committee on investor responsibility, sustainable investment, and investment disclosure. A total of 7 possible points can be earned by an IHE in this subcategory. This is accomplished by having an "active committee on investor responsibility (CIR) with multistakeholder representation" charged with making sustainable investment choices for the IHE by promoting and maintaining transparency through public disclosure.

Innovation:

An IHE can also earn points for innovation. A total of up to 4 points can be added to the overall STARS score for an IHE that demonstrates sustainability practices beyond what is covered by the STARS assessment. These practices, programs, or policies must be unprecedented and result in positive impacts similar to other STARS criteria.

29