sustainability
INSTITUTE

Sustainability Planning Guidebook

PennState

Table of Contents

Cover Photos:

Top image: Students helping install solar panels at GridSTAR Center, a smart grid educational and operational research center that is part of the Architectural Engineering Department at Penn State, located at The Navy Yard in Philadelphia. Photo credit: Penn State

Bottome left: Anna Nguyen, a food science major and Schreyer Honors Scholar at Penn State Brandywine, produces podcasts on topics related to Project Drawdown during Penn State's Drawdown Scholars Research Experience for Undergraduates program in Fall 2018. Photo credit: Michael Mcdade

Botttom middle: Hayly Hoch harvests Red Russian kale at the Student Farm at Penn State (2017). Photo credit: Penn State

Bottom right: Staff engage in activities during a Commonwealth Campus Sustainability Forum in Spring 2019. Photo credit: Penn State

Sustainability Institute, Penn State University • sustainability.psu.edu • 2019

Letter from the Director, Sustainability Institute

Thank you for picking up this Sustainability Planning Guidebook. We laud your commitment to sustainability and want to make it easy for your unit to organically develop its own authentic approach to sustainability. To do this in a complex organization, a common guiding framework is needed. Penn State uses the UN Agenda 2030's 17 Sustainable Development Goals (SDGs) shown on page 2. These goals clearly illustrate that achieving sustainability requires us to address the environment, as well as our social, cultural, economic and technological systems. This approach requires not only research, teaching and operational changes, but also deep engagement with community stakeholders, businesses, and government agencies throughout all our campuses.

To improve our sustainability efforts, we need disciplined action in each and every unit—across every college and campus. Universities must be agents of social adaption and transformation, developing critically engaged citizens whose endeavors will support the public good, now and into the future. The Association for Advancement of Sustainability in Higher Education (AASHE) sustainability reporting system rates universities on 69 different metrics measuring academics, engagement, operations, and planning and administration. In 2017 Penn State scored a 67.9% total, which is good, but we can do much better. The strategic planning process of the University gives us a great opportunity to work together and lift sustainability to the next level. As shown on the next page, thematic priorities and foundational elements core to Penn State's strategic plan closely align with the global SDGs.

Sustainability and empowering resilience is a shared responsibility that requires ongoing innovation and improvement from all of us. It is more than another thing to do or box to be checked. Improving our performance and empowering resilient solutions to such contemporary challenges of the Anthropocene as social injustices and inequalities, access to education, global food security and reversing climate change requires each unit to take ownership of sustainability by linking its own mission and expertise to the sustainability challenges facing their communities. Addressing these challenges may begin with establishing an internal sustainability champion or coordinator, creating a sustainability council, establishing one or more Green Teams, and/or encouraging faculty and staff to join the Sustainability Institute Affiliates Program.

Use this guidebook reference as you deliberate and negotiate the complex interdependencies and tradeoffs involved in developing sustainability plans. This resource is not to be taken as a rigid template; instead, it offers suggestions to structure the sustainability planning process. In many units, discussions will likely go past what is covered in this guidebook. We are happy to assist you with personal attention and assistance throughout the process. Contact us via email at sustainability@psu.edu.

Penn State is diverse and geographically distributed—both a strength and a challenge for sustainability planning across the University. With the help of this guidebook, your unit will develop a unique strategic plan that contributes to the goal of achieving a collective vision of sustainability. Moving ahead, our biggest strength will be the shared passion and commitment to sustainability of our faculty, students, staff and administrators. Thank you for all that you do to help make Penn State a sustainability champion!

– **Dr. Paul Shrivastava**, *Director, Sustainability Institute*

United Nations Sustainable Development Goals, un.org/sustainabledevelopment/

Goal 1: End poverty in all its forms everywhere

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5: Achieve gender equality and empower all women and girls

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Goal 10: Reduce inequality within and among countries

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12: Ensure sustainable consumption and production patterns

Goal 13: Take urgent action to combat climate change and its impacts

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

Penn State's Strategic Plan and its connection to the Sustainable Development Goals

Penn State's Vision:

Penn State will be a leader in research, learning, and engagement that facilitates innovation, embraces diversity and sustainability and inspires achievements that will affect the world in positive and enduring ways.

Foundational Elements

Enabling access to education
We will place pursuing and completing a Penn State education within reasonable reach for students and their families. Many factors contribute to the ability to earn a Penn State degree, and we must address them all if we are to increase access, especially for populations that have historically had barriers to entry. Advances SDG 4

Engaging our students
Penn State will promote and enable undergraduate and graduate student engagement in worthwhile, substantive, academic and non-academic activities outside of the classroom, including providing opportunities in student-run organizations and facilitating internships, community service, global experiences, and research with faculty. Advances SDG 16

Fostering and embracing a diverse world
Students, faculty, and staff alike rightfully demand that the University be inclusive and make meaningful efforts to be successful and accountable. Diversity planning goals include creating a welcoming and inclusive campus climate; advancing and build a diverse student body; advancing and building a diverse workforce and management; developing a curriculum that fosters US and International Cultural competencies. Advances SDG 16

Enhancing global engagement
Continuing to build a "Global Penn State" will include enhancing global competencies by sending students, faculty, and staff abroad; internationalizing the University by bringing non-U.S.-born students and scholars to our campuses; and establishing a global network of partnerships that enables the University to pursue its mission worldwide. Advances SDGs 16, 17

Driving Economic Development
Penn State's educational programs, research, and outreach will make measurable and meaningful differences in economic development for our communities, from local to global. By leveraging our size and broad research strengths, Penn State can drive job creation, economic development, and student career success. We will accelerate the transfer of new ideas into useful products and processes in areas such as energy, food and nutrition, environmental protection, health care, manufacturing, educational technologies, medical devices, and pharmaceuticals. Advances SDGs 6, 7, 8, 9, 11, 12, 13

Ensuring a sustainable future
Penn State will confront directly and assertively the global challenges of climate change and sustainability in all their complexity—from feeding a growing population to preserving Earth's resources to ensuring energy security. As an institution of higher learning and research, Penn State has a responsibility to embody and communicate an evidence-based worldview that allows all of us to prosper, both now and in the future. Advances SDGs 2, 3, 4, 6, 7, 9, 11, 12, 13, 14, 15

Thematic Priorities

Transforming education *Advances SDGs 4, 8*

Enhancing Health *Advances SDGs 1, 2, 3*

Stewarding our Planet's Resources
Advances SDGs 6, 7, 9, 11, 12, 13, 14, 15, 17

Advancing the Arts and Humanities
Advances SDG 4

Driving Digital Innovation
Advances SDGs 6, 7, 8, 9, 11, 12, 13

Supporting Elements

Organizational Processes *Advances SDG 8*

Infrastructure and Support *Advances SDG 9*

Constituent Outreach and Engagement
Advances SDGs 9 ,17

Overview of the Guidebook

Why a sustainability planning guidebook?

The Sustainability Institute (SI) created the guidebook and associated web-based resources to help units:

- *Focus on the right things* – Identify what is appropriate for your particular unit, leverage what you are already doing, and find alignment with University priorities and values.
- *Save time* – Sustainability planning is a new idea and the six-step process and associated tools make it straightforward.
- *Learn from others* – On the website (sustainability.psu.edu/guidebook) are several case studies illustrating some best pactices as well as examples throughout the guidebook.

> ***"Sustainability is the simultaneous pursuit of human health and happiness, environmental quality, and economic well-being for current and future generations."***
>
> – Penn State Definition of Sustainability

What will the guidebook help my unit do?

With an engaged, dedicated team using it together, the guidebook leads to actionable sustainability strategies that advance a unit's and the University's priorities, Penn State's educational and research mission, and contribute to Pennsylvania and global sustainability goals.

Strategic sustainability enhances a unit's ability to:

- Attract, engage and educate students
- Attract and retain the top faculty, staff, and administrators
- Advance research innovations and access to new funding
- Reduce our negative environmental impacts and enhance our positive ones
- Create new program innovations and enter new markets
- Reduce operating costs and risks

A unit also discovers its unique contribution to Penn State's Strategic Plan's six foundational underpinnings:

- Enabling Access to Education
- Engaging our Students
- Fostering and Embracing a Diverse World
- Enhancing Global Engagement
- Driving Economic Development
- Ensuring a Sustainable Future

Through this process, a unit's role in supporting the University's 5 key themes will become clear, including:

- Stewarding our Planet's Resources
- Advancing the Arts and Humanities
- Enhancing Health
- Transforming Education
- Driving Digital Transformation

These outcomes become possible through the effective integration of sustainability into your planning process. We define "effective" as fulfilling six criteria:

- **Mission** – Leverages and enhances unit mission and expertise
- **Leadership** – Secures senior leadership support
- **Resources** – Receives sufficient resources (e.g. people, time, technology, funding)
- **Integrated** – Integrated into organizational processes
- **Specific** – Outlines specific, actionable steps with clear roles and accountability
- **Measurable** – Achieves measurable sustainability outcomes

Who is this guidebook for?

The guidebook is primarily for planning teams at Penn State campuses, locations, colleges, and support units. However, it could be useful for anyone wanting to find their unique contribution to the University's sustainability strategy.

How should this guidebook be used?

1. Assemble your team (tips for doing this effectively are on page 8).
2. Review the Quickview of the Six Steps on page 6.
3. Review the resources and tools on our strategic planning website (sustainability.psu.edu/guidebook).

What is sustainability strategy?

Bryson (1995) defines strategic planning as "... a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it."[1]

[1]Bryson, John M. (1995). Strategic Planning for Public and Nonprofit Organizations – A Guide to Strengthening and Sustaining Organizational Achievement (Revised Edition). San Francisco, CA: Jossey-Bass.

Tips for the Facilitator

Each of the six steps features suggestions for the facilitator of your sustainability planning process.

These tips will be in a colored box, like this one, at the beginning of each step.

Consider how you can involve students every step of the way. This could be a rich learning experience for them in the development of your plan and in its evaluation.

Sustainability is a way of thinking that concurrently considers the social, environmental, and economic dimensions of our decisions. Strategic sustainability, therefore, is a carefully considered plan combining short- and long-term strategies, tied to a unit's mission and goals, which advance the university's sustainability vision and mission.

Strategic sustainability is a carefully considered plan combining short- and long-term strategies, tied to a unit's mission and goals, which advance the university's sustainability vision and mission.

This view of *strategic* sustainability is different from the one held by most people. Sustainability often creates immediate vivid mental images of recycling bins, climate change, hybrid vehicles, green roofs, and solar panels. Their immediate reaction may be to focus on these things whether they are really strategic or not. In reality, sustainability is a new perspective that can be a source of substantial strategic value. **The key to harnessing the power of sustainability strategy is to find the overlap with a unit's mission, vision, expertise and assets with the U's thematic priorities, foundational elements and the global SDGs.**

Where should we send ideas and feedback? And what if our planning team would like assistance working through some of the processes in the guidebook?

We envision many more editions of this guidebook, and we need your help to make them even better. Your feedback and questions are encouraged and can be sent to *sustainability@psu.edu*.

The Smeal College of Business Story

The chance to test Penn State's 2012 Sustainability Strategic Plan provided Smeal College of Business the opportunity it needed to take its sustainability work to the next level. With a charge from the Dean, two faculty with expertise in management assembled a broadly representative task force to examine current activity and set a vision for the future. The resulting 2012 Smeal Sustainability Plan, approved by Dean Charles Whiteman who authorized funds for its implementations, touches every aspect of the college and includes 20 goals to be implemented over three years. The excerpt below lays out the plan's compelling vision:

> *Our vision is that Smeal will be a top-ten business school in the area of sustainability through our teaching, research, and outreach. Through our teaching, we will enhance the understanding of sustainable business practices and produce knowledgeable graduates prepared to apply these practices in the marketplace. Through our research efforts, we will create knowledge relative to sustainable business practices and their impact on businesses and on society. Through our outreach, we will work with industry and government to collaboratively provide thought leadership in understanding and implementing sustainable business practices, and demonstrate within Smeal how these business practices can enable organizational success.*

In 2015, Smeal College of Business hired a full-time director of sustainability and appointed a Sustainability Research Director in 2019. In 2020, the college will open the Penn State Smeal Center for the Business of Sustainability, fulfilling an aspirational goal from the 2012 Plan. To date, Smeal's progress has been impressive. Over 14,000 undergraduates have gone through a required course in sustainability, which includes critical topics such as diversity and ethics. 400 students have graduated with the "sustainability two-piece," a two-course sequence in sustainable business, and 800 MBA students from across the country have participated in Smeal's Sustainability Case Competition.

Among many lessons, they learned the following:

- Appoint a faculty or staff champion in sustainability who is well-respected and possesses strong communication and leadership skills in order to overcome obstacles and leverage existing support and initiatives
- Secure senior leadership support and dedicated resources.
- Determine what needles you are trying to move and the key metrics you will track and report
- Recognize the potential risks of engaging with sustainability (e.g. greenwashing, companies using academia for public relations) and create mechanisms to identify and avoid them
- Keep internal councils small enough to move quickly, large enough to be representative. Councils at Smeal are no larger than eight people.
- Promote diversity and inclusion, recognizing sustainability is impossible without it

For more information: *www.smeal.psu.edu/sustainability-council*

[2]Smeal Sustainability Strategic Plan, available at *sustainability.psu.edu/guidebook*

Quickview of the Sustainability Planning Process

Quickview Worksheet

You can use this worksheet as you go through the guidebook. ***As you complete each of the six steps starting on page 11, fill in the corresponding section below.*** At the end, you will have all of your key lessons and outputs on one page. This page also shows you and your planning team what you will get out of working through various parts of this guidebook.

1

Initial thoughts on how sustainability connects to our unit's mission and expertise, priorities of the University's Strategic Plan and related SDGs:

_____

_____

2

We think that our unit is at this level on the Maturity Model: _____

And we think our strengths and opportunities are:

Strengths to Leverage:

_____

_____

Areas for Improvement:

_____

_____

3

Our unique contribution to sustainability is: _____

_____

_____

4

Our vision of sustainability for our unit: _____

_____

_____

5

Of all our potential sustainability goals, the most important are: _____

_____

_____

6

The most important support system for what we want to accomplish is: _____

_____

_____

Our implementation plan will be completed by: _____ / _____

Person's Name Date

Tips on Forming Your Sustainability Planning Team[3] or Council

Incorporating sustainability into your unit strategic plan represents a new challenge. Be sure to assemble the right people and use the lessons from past experiences.

Consider having representations from faculty, staff, administrators, and students on your team.

Pick the Right People

Choosing who in your unit or department works on sustainability integration could be one of the most important decisions.

The most effective teams involve a small, diverse group in which each member has the following qualities:

- Good listener and communicator
- Well respected within the unit or department
- Positional authority
- Commitment to sustainability as a strategic opportunity for the unit
- Consider faculty, staff and students as members

Does the team have a clear charge from the unit leader?

Assess Readiness

Discuss your answers to the following questions:

How much change is happening right now in your unit?

How aware and supportive of sustainability is your unit or department?

How aware and supportive of sustainability is your leadership?

Higher levels of readiness mean your team can go for bolder goals and higher risk strategies. Lower levels suggest a focus on goals that are lower risk and help build buy-in and support.

Rate yourself from 1 (low readiness) to 5 (high readiness).

Build on the Past

Discuss similar initiatives from the past to identify what worked and what didn't: use what works to integrate sustainability effectively.

On a whiteboard or sheet of paper, create two columns and fill them in.

What worked well...
What we would do differently...

Be sure to talk to people in the unit with first-hand experience with past initiatives.

The 3 C's of a Formal Planning Structure

Consider creating a Sustainability Council to formalize and elevate the recognition of the planning process.

Best practices for these Councils include:

- Appoint a Chairperson
- Create a Charter that outlines purpose, principals, organizational structure and procedures. See example charters at sustainability.psu.edu/guidebook.

[3]Hitchcock, Darcy E., and Marsha L. Willard. The Step-by-step Guide to Sustainability Planning: How to Create and Implement Sustainability Plans in Any Business or Organization. London: Earthscan, 2008

Worksheet

Assembling Your Team/Council and Preparing for Strategic Sustainability

Pick the Right People: Write names below:

_____ _____

_____ _____

_____ _____

_____ _____

Build on the Past: What we learned from past initiatives:

_____

_____

_____

_____

Assess Readiness: We rate our readiness as: _____ (1 low – 5 high).
What could be done to increase readiness?

_____

_____

_____

_____

Sustainability Council: If you form a Council, do you have: ☐ Chair ☐ Charter

Six Steps to Sustainability Planning

Image: Penn State

Image: Penn State

Image: Penn State

1 Understand Sustainability

2 Assess Current State

3 Identify Priorities

4 Create a Vision of Sustainability

5 Set Goals and Develop Metrics

6 Develop an Implementation Plan

Top image: The Sustainability Experience Center on University Park campus includes technology and living labs related to sustainability, including a home powered by 100% renewable energy, a wind turbine, and an electric vehicle charging station.

Bottom left: Sustainability Institute staff members participate in Bike to Work Day in State College, PA on September 27, 2019

Bottom right: Penn State New Kensington becomes first campus to complete all levels of Sustainability Insitute's Green Paws program (December 2018)

STEP 1 Understand Sustainability

Sustainability planning begins with ensuring that everyone on the planning team has a shared understanding of sustainability, what it means to Penn State, and what it could mean for your unit. When you have completed this step, you will have:

- An understanding of sustainability as a defining issue for higher education
- Penn State's definition of sustainability and its connection to the University's strategic plan and the SDGs
- High-level ideas for potential strategies

Understanding sustainability and Penn State's approach will save time and effort. This understanding will spur thinking, begin to provide a decision-making framework, and ensure your plan is aligned with the University's sustainability vision and mission.

The Challenge

Today, we face the global challenge of sustainability, and Penn State is answering the call as its faculty, staff, students, and communities race to solve some of the toughest problems in history, including mitigating the dangers of a rapidly changing climate, addressing food, water, and energy security, and providing health and meaningful work for all people. As a major institution in modern life, higher education plays a unique and vital role in creating a sustainable society where the economic, cultural, and health needs of the world's people are met while the vitality of nature is maintained or enhanced.

Is sustainability the same as "going green"?

No, but they are related. "Going green" is a popularized way of referring to actions that reduce impact on the environment. Sustainability includes the consideration of environmental impacts, but also includes the social and economic dimensions of our decisions.

[4]Penn State Sustainability Strategic Plan available at *sustainability.psu.edu*

Tip for the Facilitator

Show the UN Sustainable Development Goals Chart at a staff or faculty meeting. Utilize the Discussion Guide available on the website. Be sure to write down the key ideas people mention. Similarly, ask that everyone read over the University Strategic Plan and come to a meeting ready to discuss how your unit can contribute *(sustainability.psu.edu/guidebook)*.

Above and beyond: look up the sustainability definition, principles or frameworks used by your peers at other institutions or by your national association, industry or trade group. This could be something students help to accomplish.

The challenges we face are substantial:

- "Nature and its vital contributions to people, which together embody biodiversity and ecosystem functions and services, are deteriorating worldwide" with 1,000,000 species are at risk of extinction from human activities (IPBES Global assessment on biodiversity and ecosystem services).
- The U.S. has just over 4% of the world's population but consumes 17% of its energy and has generated 16% of all greenhouse gas emissions (Energy Information Agency and World Resources Institute).
- "Increasing socioeconomic gap between rich and poor in major countries or regions." (World Economic Forum Global Risk 2019 report).

In sum, the science suggests we are overwhelming and depleting the living systems we need to survive, and increasingly the poorest and most underserved populations bear the largest burden. It is notable that the challenges we face are in large part unintended consequences. Many issues of our own making have arisen from human innovations and aspirations for a better life for ourselves and our children, innovations and aspirations that higher education has supported. How can we rethink and reinvent higher education so that we regenerate ourselves and the world we live in?

Sustainable development brings the necessary shift in understanding to seeing the connections that the health of people and the health of living world are interconnected.

Today, Penn State recognizes this by using the framework of the United Nations Sustainable Development Goals. These goals prioritize actions that link human health and well-being, economic and technological innovation, environmental conservation, good governance, and partnerships to create a more just and sustainable world. This represents a critical shift in understanding.

A way to visualize this shift in understanding is in our systems of production and consumption. The old way of thinking has been referred to by Willard (2012) as "take-make-waste."[5]

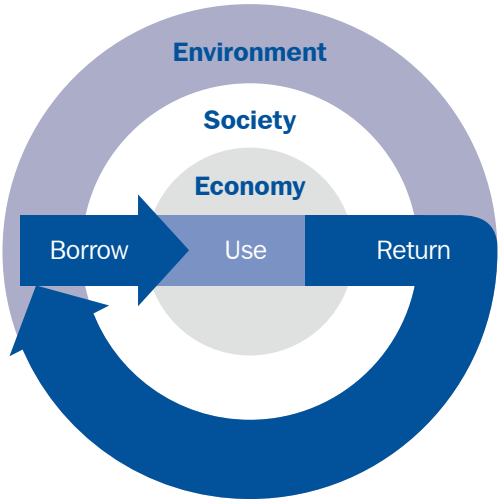
This line of thinking, still prominent in some sectors, is that we can take whatever is needed from the environment and society, make a low cost product, and dispose of the waste. All the emissions, loss of habitat, and health and safety concerns are seen as a cost to be avoided and are not considered in the process.

We now recognize our connection and complete dependence on ecological health and therefore the need for a new model. The new way of thinking is the "*borrow-use-return*" model. This model suggests we borrow natural and human resources, use them efficiently and respectfully, and then return value to society and to the environment. In this model, we aim to not pass our costs of doing business to society, future generations, or the environment.

This concept can be illustrated with an example from Penn State's Food Service Unit. Recognizing the high social, environmental, and economic impacts of food waste, that division bought Lean Path, a system to help it measure the amount of food prepared, eaten, and wasted in the dining halls. These metrics helped identify decision points for staff and consumers. Some leftover food is donated to local charities, while other kitchen scraps and uneaten food are sent to Penn State's compost facility. There it is processed and released to campus as a nutrient for plant growth.

Old Way of Thinking

New Way of Thinking



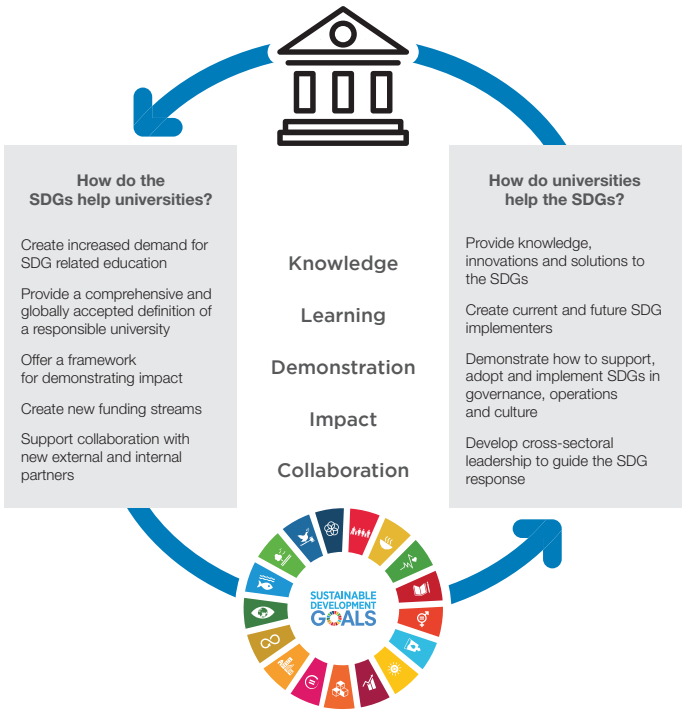
[5]Willard, Bob. The New Sustainability Advantage: Seven Business Case Benefits of a Triple Bottom Line. Gabriola Island, B.C.: New Society, 2012.

Higher Education's Role

"I think any self-respecting educational institution ought to judge its policies by its best estimate of what their long-term consequences for their students and for the society will be."
~ Derek Bok, former President of Harvard University

In 2016, nearly 70% of graduating high school students in the U.S. entered college. With the majority of young people attending post-secondary institutions, higher education has grown to have significant influence on the skills, knowledge, and values in the U.S. and around the world. How can we ensure that our young people understand sustainability challenges and are educated to master the skills needed to meet these challenges?

The case for university engagement in the SDGs.



This was excerpted from the *Getting Started With The SDGS In Universities*.

Higher education plays a unique role in creating a sustainable society because of the impact, both educationally and financially, of the sector. For example:

- There are 4,298 degree-granting postsecondary institutions in the U.S. as of the 2017-2018 (US News and World Report).
- In 2015–16, postsecondary institutions in the United States spent $559 billion (National Center for Educational Statistics). That's more spent in one year than the total spent by the Spanish government in 2017.
- 20 million people were enrolled in a college or university (National Center for Educational Statistics).

In sheer numbers, the influence of higher education on economy and society is tremendous. How have our institutions approached sustainability?

For the last 30 years, university leaders, faculty, and staff have been taking the challenges seriously. In 1990, a group that named itself University Leaders for a Sustainable Future drafted the Talloires Declaration. They wrote, "We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources."[6] They called for rapid deployment of resources to tackle sustainability challenges. In the years since, universities have recognized these challenges and responded by integrating sustainability into their very DNA. As a land grant Research 1 university, Penn State is doing this by infusing sustainability into our operations, academics, research, students' lives, and engagement with our communities across the Commonwealth and the world. In doing so, many of the University's thematic priorities and foundational elements support the SDGs, such as Enabling Access to Education, Enhancing Global Engagement, Fostering and Embracing a Diverse World, Enhancing Health and of course, Ensuring a Sustainable Future and Stewarding our Planet's Resources.

[6]University Leaders for a Sustainable Future (ULSF) was founded in 1992 and was the first organization in the United States focused on sustainability in higher education. ULSF also serves as the secretariat for signatories of the Talloires Declaration, a statement of 10 principles for higher education. This statement is from its website *www.ulsf.org*

Living Laboratories and their role at Penn State:

Extending a Penn State education beyond the classroom can be accomplished by using the University's and communities' facilities and programs to provide a "living laboratory" for academic enhancement, research partnerships, and student engagement. Through this avenue, both students, the University and communities benefit from the process.

Living Lab examples:

Living Laboratory Approach To Sustainability	Traditional Approach to Sustainability
Academic Unit: Smeal College of Business is using its own building as a teaching tool as it earns LEED-EB certification.[7]	Academic Unit: Sustainability content is added to an existing course.
Support Unit: A Communications class creates a marketing plan for the University to introduce reusable "to go" containers in the dining halls.	Support Unit: The University food service introduces reusable "to go" containers in the dining halls.

Image: Penn State

Katie Leite organizes a Plant Sale for the Student Farm at Penn State (2019).

Living Lab and Community Engagement Examples

Over the past decade, Penn State, faculty and students have engaged in hundreds of living lab and community engagements projects, including:

- Agricultural and biological engineering students developing a composting plan for Bellefonte Borough that assisted the municipality in getting a $400,000 grant.
- Landscape architecture and ecology students working with F&B, local governments and community members to generate designs for a 365 land asset that could be gateway between State College and the Rothrock State Forest.
- Engineering students working with local governments to take novel approaches to stormwater, water quality monitoring, and onsite solar energy production.
- Kinesiology faculty and students working with a local tech developer to create an app that supports healthy alternative transportation choices.

Before You Go On!

Go back to page 7 and write your conclusions in *Step 1* to the question about how sustainability connects to your unit's mission and expertise.

[7]LEED stands for "Leadership in Energy and Environmental Design," a building certification created by the U.S. Green Building Council to ensure that there are clear standards for sustainable design and operation of buildings. The EB signifies that the standards are applied to an existing building. Learn more at www.usgbc.org. Penn State has a policy to build to LEED standards for all new construction and major renovation.

STEP 2 Assess Current State

Sustainability planning is supported with a sound understanding of the current state of the organization in relation to sustainability. What is already happening that you can leverage? Where are the missed opportunities? When you have completed this step, you will have:

- An understanding of your unit's strengths and areas for improvement in sustainability
- A baseline of activity you can leverage

Sustainability Maturity Model

The Sustainability Maturity Model allows a unit to understand its stage of engagement with sustainability. The model also points to appropriate steps that can be taken to capture existing opportunities and ascend to the next stage. As you will see, the model presents four stages:

- Stage 1: Starting
- Stage 2: Implementing
- Stage 3: Integrating
- Stage 4: Transforming

We have found the model to be a quick and effective way to spur productive discussion.

Tip for the Facilitator

Project the Sustainability Maturity Model on a screen or hand out hard copies. Ask people where they would plot their unit on the model. You can then do a round robin to let each person talk in turn.

Above and beyond: Benchmark with departments and units at peer institutions and/or research sustainability activities in your particular industry or discipline.

Maturity Model

The Sustainability Maturity Model (on page 18) was created by the Sustainability Institute to help the university and units within it to understand the various types and levels of engagement with sustainability. Units are at many different stages in their engagement with this new topic, and each unit relates to it differently, depending on the unit's unique mission.

The goal here is not to go deep into an analysis of your unit but just to spur some discussion about where you are and where you might want to go.

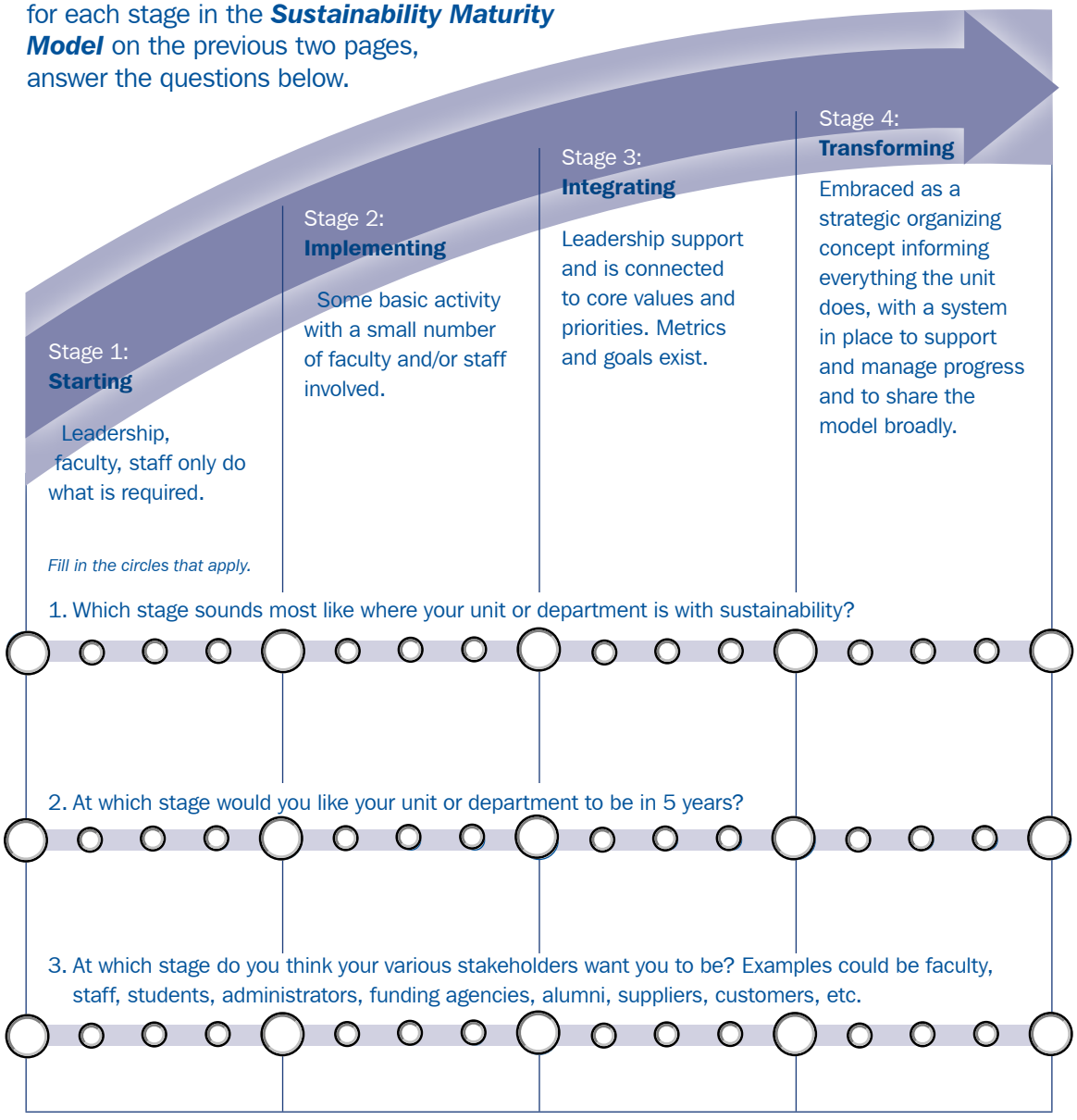
Review the common characteristics for each stage. Where would you place your unit? Put a check mark in the boxes which best describe your current state.

	Stage 1: **Starting**	Stage 2: **Implementing**	Stage 3: **Integrating**	Stage 4: **Transforming**
Teaching & Co-Curricular	☐ • Disciplinary focus in curricular "silos"; little to no interdisciplinary work • Very limited and isolated sustainability content appears in a few courses (see Appendix for definition of sustainability courses) • Co-curricular engagement is limited to environmental and/or social justice focused clubs	☐ • Initiative is taken by a small handful of "early adopter" faculty • Sustainability learning outcomes are not yet measured • A small percentage of interested students are engaged • Co-curricular programs such as lectures and internships begin to feature sustainability	☐ • There are many initiatives in many departments • Interdisciplinary approaches are common • Broad understanding of and curricula designed to realize sustainability competencies • Robust faculty and staff development and training is in place • Widespread adoption of the "living lab" concept of using the campus and community for learning	☐ • Sustainability is strategically integrated into all teaching and co-curricular programs • A robust system is in place to measure learning outcomes • Sustainability awards and recognition programs exist for students, staff, faculty, and alumni • The unit's story and model of sustainability excellence is shared beyond the department/ unit with others within and beyond the university
Research	☐ • Research is on siloed sustainability topics (see Appendix for definition of sustainability research) • Research agendas don't take advantage of collaborations with other disciplines • Little to no mention of sustainability research in unit publications • Little or no discussion of discipline-specific contribution to sustainability	☐ • Centers begin with discipline-specific sustainability focus • Engagement begins with other disciplinary areas • Survey of emerging sustainability research topics, including global and local • Research partnerships exist to address campus and community challenges	☐ • Research agenda considers emerging sustainability research needs • Research partially directed to challenges on-campus, in the community • Formal processes for documenting and rewarding sustainability research • Common theme in communications and publications • Development of impact criteria	☐ • Directing inquiry to sustainability challenges • Rewards/recognition exist for sustainability-based research • External partners recognize expertise • Consistent theme in communications and publications • Research agendas are reviewed institution-wide for synergies across disciplines and colleges • Convene meetings and collaborations with other institutions
Service & Community Engagement	☐ • Undefined rhetorical reference to "service" • Random or limited community involvement • No mention of service and community engagement in unit publications • Little or no relationship between unit and community sustainability challenges	☐ • Awareness of community and its connections to unit • Community representation on unit advisory boards • Community-based sustainability research and teaching valued by some faculty • Community members can easily access unit resources • Engagement seen as "outreach" to the community	☐ • Stories of community/unit sustainability partnerships common in unit publications • Mechanisms exist to support community-based research, teaching, and service • Understanding of diverse communities with different priorities and interests • Engagement seen as a two-way process with community as an equal partner	☐ • Community engagement is central to the mission • Community knowledge is seen as essential to the education of students • Community-based sustainability experiences are embedded across the curriculum • Partnership transforms both the community and university with framing of issues and solutions arising from both

	Stage 1: **Starting**	Stage 2: **Implementing**	Stage 3: **Integrating**	Stage 4: **Transforming**
Operations	☐ • Sustainability is only about compliance and cost avoidance • Limited understanding and encouragement of sustainable operations practices • Regarded as the work of only certain people such as energy engineers • Decision-making focus is on reducing upfront cost, not life cycle cost	☐ • Sustainability is about short term cost and risk reduction • Sustainable operations practices are encouraged by a few unit leaders • Short term, measurable goals are established for resource and environmental conservation and restoration • Start to look beyond institution to supply chain impacts and opportunities	☐ • Sustainability is a source of innovation and long term value creation • Life cycle costing is a requirement of all major decision-making • Strategic collaborations initiated with on/off campus partners • All unit employees trained in sustainable operations • Long term measurable goals and metrics are established, made public	☐ • Sustainability is a strategic, integrating priority for the entire unit • System in place to recognize and reward innovations • Unit is regarded as a national and international leader in sustainable operations • Mechanisms are in place for regularly sharing the model with other institutions
Planning & Administration	☐ • Leadership is either unaware or suspicious of sustainability • Environmental issues are seen as a cost and the work of facilities staff • The culture is oriented toward doing only what is required by university policy, state or federal law, codes, accreditation requirements, etc.	☐ • Leadership is tolerant of sustainability as a potentially important new area of focus • Not integrated into the core priorities of the unit • Initiatives exist but are not connected to any goals or overarching strategy	☐ • Leadership regards sustainability as an important area of focus • A formal sustainability task force, council or committee exists • There are goals and metrics for sustainability • Sustainability is beginning to be a part of discussions of core values and strategy for meeting the unit's top priorities	☐ • Leadership embraces sustainability strategy as a key aspect of the unit's vision, mission, and long-term strategy • Everyone has a basic understanding of sustainability and how it relates to her/his discipline and work • Sustainability is integrated into the unit's strategic plan with specific metrics tied to core University priorities • Support systems are in place at the policy and administrative level • Measurable, high level goals
Action Steps	• Survey those already interested and working in the area of sustainability at work and at home. • Begin some pilot projects. • Begin a process for learning about sustainability and its connection to your particular unit.	• Review existing and past initiatives to evaluate what worked and what did not. • Form a Sustainability Council to integrate sustainability more strategically. • Establish a preliminary vision and rationale for pursuing sustainability. • Set goals and preliminary metrics.	• Gather input from internal and external stakeholders on the unit's sustainability strategy. • Embed sustainability into the unit's planning and review processes. • Ensure all members achieve an understanding of sustainability and the skills, knowledge and tools they need to apply it to their work.	• Continue to build internal understanding and competencies, reward structures, and more aspirational goals. • Seek opportunities to share your accomplishments beyond the university. • Extend external partnerships in industry, local government, etc. through higher levels of engagement and collaboration. • Work with sector and national/ international groups to change high level policy or standards that inhibit sustainability innovation.

Worksheet

Instructions: After reading over the characteristics for each stage in the ***Sustainability Maturity Model*** on the previous two pages, answer the questions below.



Fill in the circles that apply.

1. Which stage sounds most like where your unit or department is with sustainability?

2. At which stage would you like your unit or department to be in 5 years?

3. At which stage do you think your various stakeholders want you to be? Examples could be faculty, staff, students, administrators, funding agencies, alumni, suppliers, customers, etc.

Discuss your answers as a planning team.

Before You Go On!

Go back to page 7 and write your conclusions in *Step 2*.

STEP 3 Identify Priorities

Units that successfully integrate sustainability into their strategic plan are able to find the "sweet spot" where internal abilities meet external opportunities. This convergence of internal and external realities is where a unit will discover its unique contribution to Penn State's sustainability vision. When you have completed this step, you will have:

- An understanding of how sustainability challenges impact your unit
- A list of potential strategic sustainability priorities

Strategy Starts With Looking Outside

Strategic sustainability starts with a look at the sustainability challenges that have the greatest impact on an organization—and that are most impacted ***by*** that organization. For example, if you are a unit that generates a lot of waste, you may want to focus on waste minimization strategies. Likewise, if you are at a campus in or near an urban area and in a unit that works directly with students, you may want to create learning opportunities for students to engage with urban sustainability challenges, such as food insecurity or affordable housing.

A unit can analyze how these challenges translate into risks and opportunities. Then the question becomes, "What will our strategic response be?" Understanding sustainability challenges is key to the processes in this section. The table below is meant to provide further illustration of what is meant by "sustainability challenges" and how they matter to various organizations.

Tip for the Facilitator

This step may be the most challenging—and most important. Take some time to look over the graphic "Global Sustainable Development Goals" on the next page as it communicates a key message about how sustainability challenges present strategic opportunities. Be sure the team understands this concept before moving on. The sustainability *Strengths, Weaknesses, Opportunities, and Threats* (SWOT) could either be done individually and then the group would come back together to share ideas, OR you could go through it as a whole group. Either way, eventually you will want to list the sustainability challenges, opportunities, threats, strengths, weaknesses, etc. on a whiteboard or sheets of paper. Again, make sure you have someone who can write down all the comments.

Above and beyond: Just doing this step is going above and beyond.

Company/Organization	Relevant Sustainability Challenges
Google	Energy use/renewable energy; digital divide
Nike	Material scarcity, waste management, and supply chain issues, including environmental and labor relations
Dow Chemical	Waste management in chemical manufacturing; toxicity of synthetic chemicals; renewable sources of chemicals
City of Philadelphia	Affordable housing, energy and emissions, food security, poverty

The graphic below presents a list of some of the SDGs and their aligned University priorities to illustrate how global challenges translate into risks and opportunities for higher education. Also revealed are the potential strategies that could be employed to capture the opportunities and avoid the risks.

Global Challenges Lead to Strategic Opportunities for Higher Education[8]

Sustainable Development Goals and University priorites

SDG 2: Zero Hunger
SDG 3: Good Health & Well Being
PSU Priority: Enhancing Health

SDG 6: Clean Water and Sanitation
SDG 7: Affordable and Clean Energy
SDG 13: Climate Action
PSU Priority: Stewarding our Planet's Resources

SDG 10: Reduced Inequalities
PSU Priority: Enabling Access to Education

SDG 12: Responsible Consumption and Production
PSU Priority: Driving Economic Development

Add your own challenges, if you'd like:

_____

_____

_____

_____

_____

_____

_____

...translate to colleges and universities as

RISKS

Students, grad schools and employers look elsewhere

Misalignment between national research priorities and university capacities

Community needs unmatched by university capacities

Price volatility and increasing operating costs

OPPORTUNITIES

Demand for sustainability-related courses, research opportunities and learning outcomes

New funding and revenue sources

Reduced operating costs

Innovation and tech transfer

and lead to these strategies

New research areas, particularly transdisciplinary

New curricular and co-curricular programs to meet demand

Strategic partnerships with external stakeholders in industry, government

New technologies and approaches to reducing operating costs and total cost of ownership

Living laboratory strategies to unite efforts in teaching, research, outreach, and operations

Sustainability challenges translate into risks and opportunities for the companies mentioned earlier and for higher education. Such challenges exist at various scales around your unit, from the local to the regional, state, national, and international level. Remember that sustainability is a shift in understanding—an understanding that we are connected to these issues; they are not outside of our sphere of control or influence.

This new strategic sustainability perspective creates opportunities where none existed before.

Worksheet

Sustainability SWOT (sSWOT)[8]

The Sustainability SWOT developed by the World Resources Institute (WRI) is a way of identifying how an organization can recognize the opportunities embedded in sustainability challenges. The sSWOT begins with sustainability challenges and explores how their impacts flow through an organization, creating new value-adding ways to apply unique strengths to accelerate solutions to environmental and social issues. Use the Maturity Model questions to help inform the discussion.

Go through the questions as a team, or individually first, then discuss as a team. Write your answers below.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

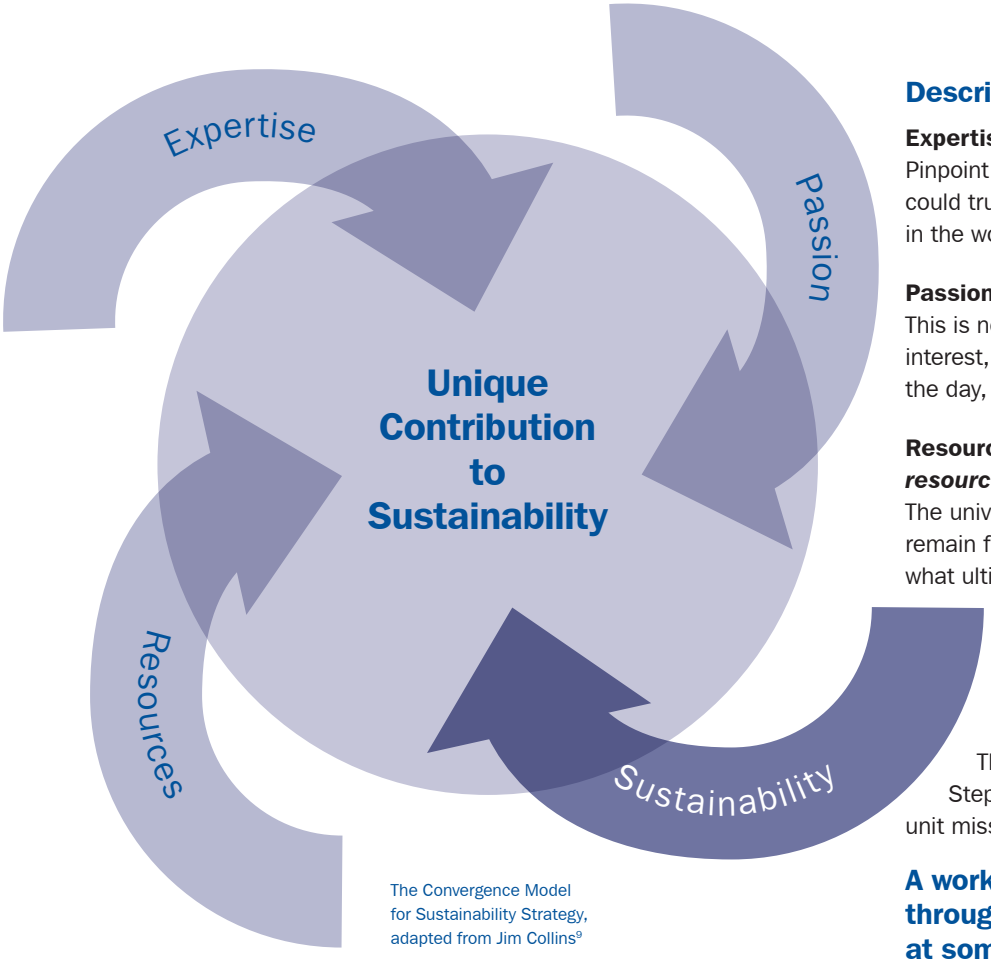
7. _____

[8]Metzger, Eliot; Putt Del Pino, Samantha; Prowitt, Sally; Goodward, Jenna; Perera, Alexander "sSWOT: A Sustainability SWOT" World Resources Institute (2012) *sustainability.psu.edu/guidebook*

Strategy Leverages What You Have on the Inside

Now that you understand the impact of these pressing global sustainability challenges, we will look more deeply at what unique expertise you have to help solve them—while driving more resources to your unit. We have developed a way for units to think about new sustainability opportunities in light of their unique internal expertise, passion, and resource requirements. We call it the *Convergence Model*.

The purpose is to find a sustainability strategy that builds on your abilities, aligns with your passion, increases resources, and works to resolve societal challenges.



The Convergence Model for Sustainability Strategy, adapted from Jim Collins[9]

Description of the Convergence Model

Expertise: ***What is your unit really good at?***
Pinpoint the unique expertise or ability where you could truly be the best at Penn State, in the country, in the world.

Passion: ***What does your unit really care about?***
This is not a brainstorm of individual areas of interest, but an identification of what, at the end of the day, your unit really cares about collectively.

Resources: ***Where do your financial and other resources come from?***
The university, and therefore each unit, must remain financially viable. For an academic unit, what ultimately determines your financial viability? For a cost recovery unit, what is your core business model?

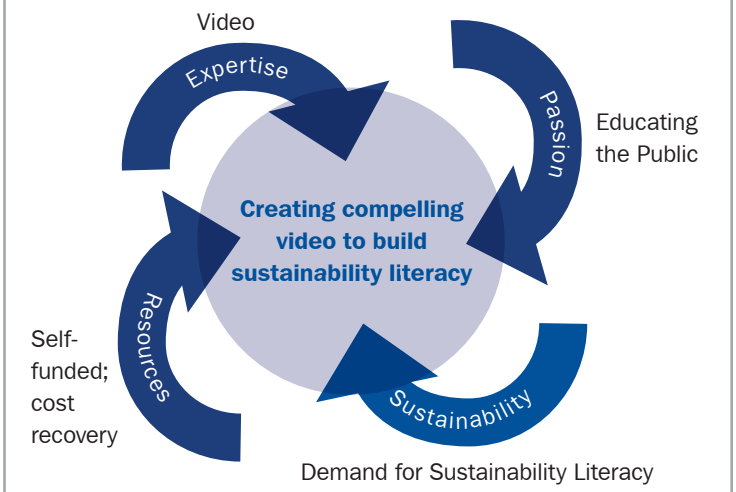
Sustainability: ***What does sustainability mean to your unit?***
This is where you plug in the result from Step 1: how sustainability connects with your unit mission and expertise.

A worksheet on page 24 will help you go through the model. First, let's take a look at some examples on the facing page...

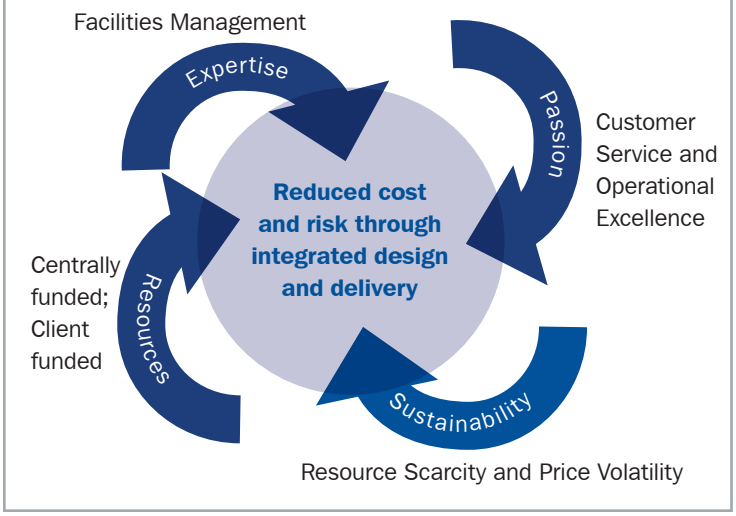
[9]Collins, J. C. (2001). Good to Great: Why some companies make the leap – and others don't. New York, NY: HarperBusiness.

Some Examples of Convergence

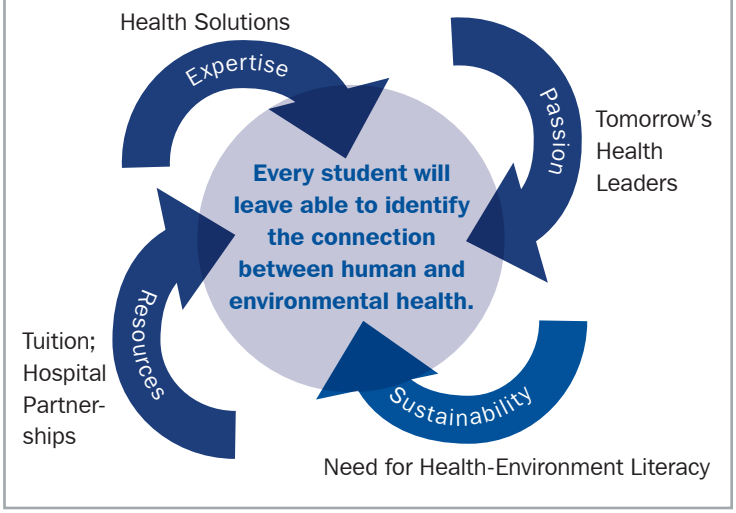
Penn State Public Media



Office of Physical Plant (Finance & Business)



College of Nursing



After looking outside at sustainability challenges, a look inside starts to suggest where a unit could make a significant contribution with benefits for society that also help to meet the unit's financial requirements. When both are satisfied, the result is a sustainable path forward.

Worksheet

Develop a Convergence Model: Write your conclusion for each factor in the corresponding boxes and see where the convergence happens for your unit. Refer back to the description of the four factors and the examples provided on previous pages.

What is your unit really good at?

What does your unit really care about?

Where do your financial and other resources come from?

What does sustainability mean to your unit?

Write a statement that summarizes what you learned:

Before You Go On!

Go back to page 7 and write your conclusions in *Step 3*.

STEP 4 Create a Vision for Sustainability

Strategic planning is done in order to identify where a unit wants to go, how it will get there, and what metrics will indicate when it has arrived. Whereas previous steps have oriented your team to the task at hand, this step now invites you to step back and figure out where you want to go. At the end of this section, you will have:

- A vision for sustainability for your unit
- Connections between your vision for sustainability and existing initiatives

Your vision will evolve over time as you experiment with various approaches and learn what works. But specifying a vision early in the process can save a lot of time down the road.

Your unit or department probably already has a vision and mission statement. In this section you're going to look at your mission and vision, what you've done so far in the guidebook, and create a sustainability vision for your unit or department. This is where you can be unconstrained, creative, and aspirational.

Why do we need a vision for sustainability for our unit or department?

Creating a clear and inspirational vision of sustainability for your unit can be one of the most powerful steps you take. This is because a vision tells us where we want to go. A good vision keeps people focused and leads to efficiency and high levels of collaboration because everyone knows the destination.

The characteristics of an effective vision are that it is a:

…vivid description…

…of a future state that your unit has helped create…

…that inspires and guides decision-making.

Tip for the Facilitator

Creating a vision should be energizing and engaging. Make sure it is aligned with your unit's core mission. Ask people to brainstorm a vision statement and write without judgment on their own for 10 minutes. Or brainstorm as a group. Make sure everyone has the chance to participate. Focus on big, aspirational visions that you aren't even sure you can achieve. Someone will need to collate the responses and draft two - four vision statements for the group to react to.

Above and beyond: Come up with an engaging method for involving your whole unit and external partners in the crafting of your unit's vision for sustainability. Review the visions of sustainability developed by others. Search "sustainability vision" online and see what you find. This will spur ideas and creative thinking.

The key is to focus on your unit's unique capabilities. When someone in your unit reads the vision for sustainability, they should feel strongly that it is something that they are uniquely a part of.

As the saying goes, "for a ship without a destination, any harbor will do." A vision sets everyone's eyes on the right destination.

Smeal developed a vision that ***every student will graduate knowing how to make the business case for sustainability.*** This vision is vivid, inspirational, and specific enough to guide decision-making.

Connecting your vision to other strategic initiatives

The vision will be bolstered through strong connections with other major strategic initiatives such as the University's Strategic Plan. In many cases, it can make sense to tie sustainability to an existing effort that already has momentum, focus, resources, and staffing.

To find these points of strategic overlap, we recommend creating what we call a *Strategic Linking Diagram*. In the Linking Diagram (next page), list other substantive strategic initiatives already taking place and look for ways to integrate your unit's vision of sustainability.

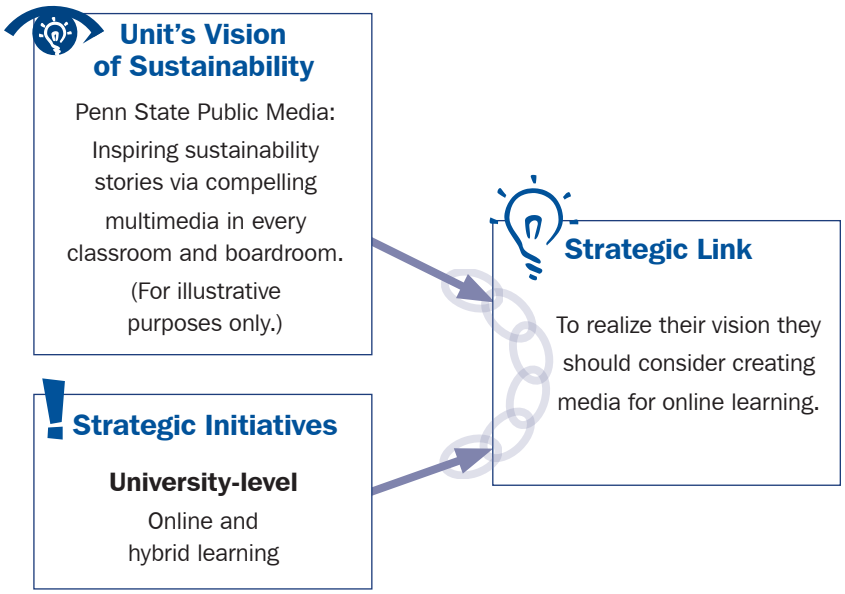
Worksheet

Strategic Linking Diagram

Connecting your unit's vision for sustainability to the University's Strategic Plan foundational elements and any other initiatives in related units.

https://strategicplan.psu.edu

Example:



Try your own:

Your Unit's Vision of Sustainability

Strategic Initiatives

Strategic Link

Before You Go On!

Before you proceed, go back to page 7 and write your answer in *Step 4*.

STEP 5 Set Goals and Develop Metrics

You have your vision of where you want to go and you have identified the internal capacities you can leverage to get you there. It's time to set some goals, objectives, actions and metrics that will get you moving.

Tools you will learn to use in this section:

- Strategy framework for sustainability
- Real brainstorming
- Decision Matrix
- SMART Sustainability Goal Builder

Strategy Combines Big Wins and Quick Wins

As a unit finds the overlap between sustainability and its mission, we find that ideas of all sizes emerge. Strategic sustainability prioritizes and organizes such ideas in order to get the right combination of short-, mid-, and long-term goals. We call these "big wins" and "quick wins."

Big Wins: Larger, longer term initiatives linked strongly to a unit's unique mission and expertise. A well-selected, ambitious initiative can galvanize a group and deliver real results. These require more investment of resources and can even involve a change in structure or business model.

For example, Penn State Public Media, set a "big win" goal of bolstering an existing, very ambitious project called Water Blues, Green Solutions, a public service media project on green infrastructure/value of ecosystem services.

Quick Wins: Short-term, tactical steps that build momentum, confidence, and enthusiasm around the larger initiatives. Many of these small actions taken over time lead to big results.

Penn State's College of Engineering has set a "big win" goal of female students representing over 50% of the College's student body by 2023, well aligned with the SDG 5 on Gender Equality and the University priority of Enabling Access to Education.

Resources for Quick Wins

The guidebook is focused on identifying larger, strategic opportunities and planning around those. But many resources exist for "quick wins."

The Green Paws Office Certification Program, for example, has checklists of many "quick win" actions.

Visit *sustainability.psu.edu/GreenPaws*

Tip for the Facilitator

Good goals leverage strengths, go after opportunities, and make a real impact within a given timeframe. When you have brainstormed a list of six to 10+ potential strategies, see if there is overlap and combine them where possible. Plot them on the decision matrix (which you recreate on a whiteboard or sheet of paper). Discuss and try to end with three to six goals. Create subteams to work on each goal using the *SMART Strategy Builder* and *Metrics Worksheet*.

Above and beyond: Involve external partners in brainstorming potential strategies and identifying the role they could play in making them a reality. Consider ways that students could be involved by, for example, gathering data or conducting research to support the process.

Image: Penn State

The Strategy Framework for Sustainability

Your unit's focus on strategic sustainability should align with the SDGs and University priorities. We have created the Strategy Framework for Sustainability that shows five major areas through which Penn State approaches its priority areas. Notice that each area is distinct yet connected to the others. Research, for example, is separate but linked with community engagement and operations.

Possible Opportunity Areas

Teaching and Co-curricular

This refers to opportunities to infuse sustainability into student learning: both curricular and co-curricular programs. This area also is home to goals aimed at increasing the capacity and capability of faculty through faculty development workshops and changes in policies or systems that impede strategic sustainability.

Examples for Academic Units

Sustainability is added to new student orientation to highlight opportunities and stories within your unit and at Penn State. Your college or campus convenes a workshop or roundtable for faculty to integrate sustainability into their courses. A Student Sustainability Summit is organized to highlight career and grad school opportunities, on-campus activities, and community resources. College advisors attend a workshop to learn about the Sustainability Minor and sustainability related courses.

Examples for Support Units

A group of staff hires an intern to help assess opportunities to reduce resource use (energy, water, material waste). Facilities staff work with a faculty member and her class to develop on-campus project proposals for applied research. Energy managers work with a writing class to develop a report on all the energy efficiency projects and results on campus or they work with a Math or Engineering class to integrate efficiency calculations into class assignments.

Research

This refers to the addition or enhancement of sustainability in undergraduate, graduate, and faculty research conducted by your unit. Perhaps there are opportunities to better link existing sustainability research or start a new research program.

Examples for Academic Units

Collaborative team forms to conduct a pilot study using regional/campus data to inform the development of a larger proposal. A new initiative to help identify sustainability-focused funding opportunities and publications is initiated.

Examples for Support Units

A team trying to figure out the most sustainable product for a particular purpose (computer or cleaning supplies for example) partners with a faculty member with relevant expertise who can conduct the proper analysis.

Service and Community Engagement

This refers to the blending of sustainability into existing or new community partnerships that provide learning opportunities for students, applied research opportunities for faculty, and benefit to the community. What problems exist in the community that your unit's expertise could help to solve? What changes—new incentives or the removal of barriers—are necessary to allow for the sharing of this expertise?

Examples for Academic Units

Staff conduct a sustainability assessment of the region to identify new market opportunities. A meeting is convened with local and regional government, business, and non-profit partners. Faculty and student teams work with local social services to create a community garden and provide fresh produce for the local food bank.

Examples for Support Units

Staff members work with local partners to arrange for a farmer's market to be held on campus. The waste management team and dining services work with local government and businesses to develop a composting program.

Operations

This refers to the integration of sustainability into the management and use of the physical facilities, vehicles, and grounds of your unit, including classrooms, labs, sports facilities, offices, and service vehicles as well as at events, conferences, and meetings. What are ways your unit can reduce resource use such as in fuel, electricity, water, materials, chemicals, etc.?

Examples for Academic Units

Faculty members convene a panel of facilities and operations staff in order to understand the current operational footprint of your unit. Following the panel, faculty and students create proposals to reduce the footprint.

Examples for Support Units

A group works with professional development and training staff to integrate sustainability into new employee training. The unit creates a goal to have staff complete the Green Paws Office Certification Program.

Planning and Administration

This refers to the ways a unit has integrated sustainability into its organizational structure, systems, and policies. Have formal structures been put into place, like a Sustainability Council with representatives from various departments?

Examples for Academic Units

Leadership appoints a well-respected leader to be the college or campus sustainability chair. An awards program is created to recognize sustainability leaders among students, faculty, and staff at an annual event. A task force is appointed to explore how the promotion and tenure criteria can support applied work on campus and in the community.

Examples for Support Units

A new policy is developed for sustainable purchasing in order to reduce packaging and the resource efficiency of products. A section is created in the newsletter to highlight sustainability projects and their results. A sustainability management system is developed with IT faculty and students to track and report on sustainability measures. Sustainability goals are integrated into annual Performance Management Goals.

Brainstorming

Many employees use this method of gathering ideas but few take full advantage of its potential. It is key to set the stage and utilize some simple rules to make "brainstorming" really effective. After you have a good set of ideas, the next tool, the "Decision Matrix," on the next page, can help you sort them and prioritize them.

How to brainstorm

Brainstorming was developed by Alex Osborn, an advertising executive, in his 1953 book, "Applied Imagination." Many researchers and practitioners since then have utilized and expanded his original ideas. From the many applications of his ideas, some keys to a good brainstorm have emerged:

- A compelling question or problem
- A creative and open environment
- A spirit of non-judgment. Replace "no, but" statements with "yes, and" ones
- Everyone has an equal opportunity to participate.
- See ideas have value
- Build on each other's ideas

The goal is quantity, breadth, and variety. You will organize the ideas later.

You have a vision of sustainability, and by now, a good sense of your unique contribution. The key question for the brainstorm is something like:

"What are the critical steps we must take to arrive at our vision?"

List as many possibilities as you can from the mundane to the outlandish. After you have a list, you can look for connections between ideas and for overlap. Then you can use the Decision Matrix to zoom in on a smaller number of strategies.

Worksheet

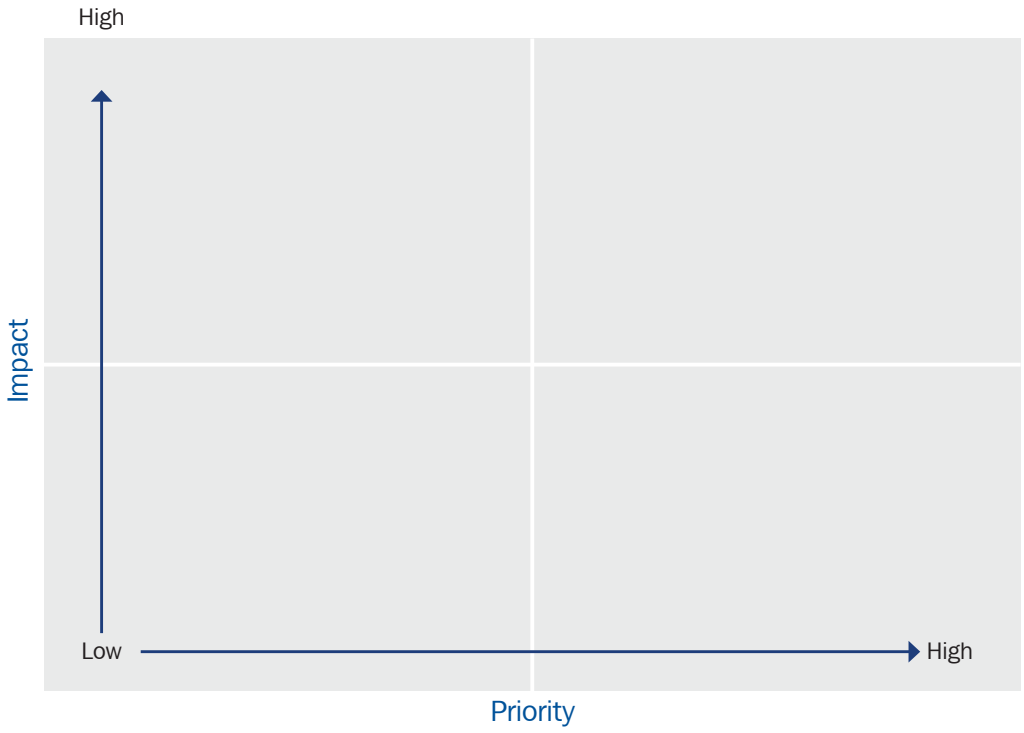
Decision Matrix

The Decision Matrix can be an effective way to prioritize a brainstormed list of potential goals. First, define and determine criteria for what constitutes "Impact" and "Priority". Second, plot the potential goals on the matrix.

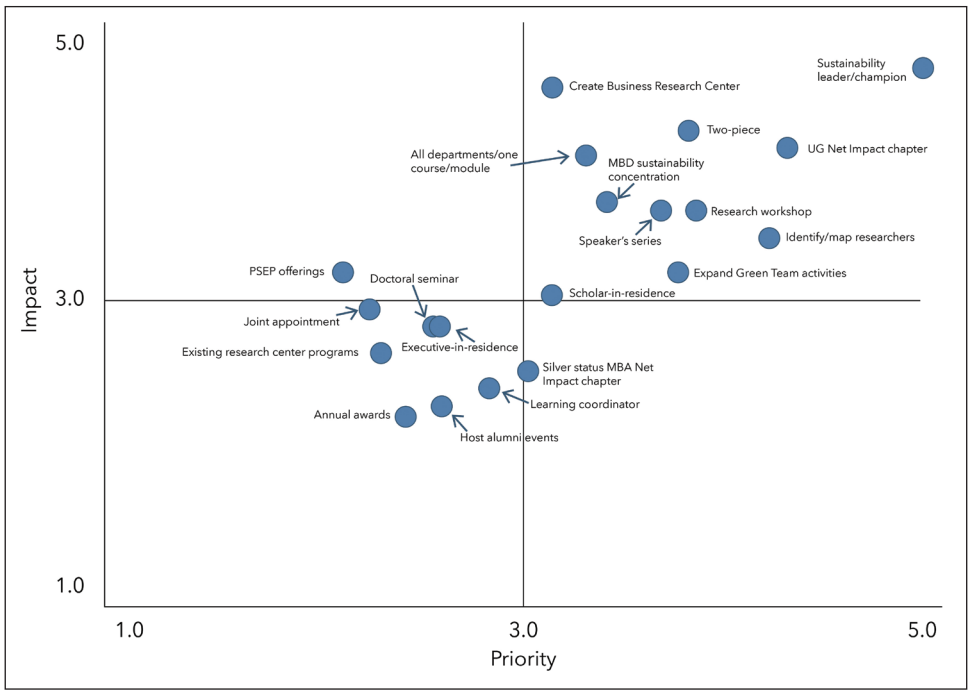
The plotting can take place via a scorecard process: a spreadsheet with criteria and associated weights assigned to each. Then each goal is scored by individuals present and the scores are summed and averaged. The plotting can also take place more quickly and subjectively, with individuals making a determination in light of the criteria.

The items in the upper right that are high priority and high impact are the top candidates.

Prioritized strategies or goals often need to be rewritten so they are specific, actionable, and measurable. The SMART Strategy Builder is a powerful, yet simple tool for this purpose.



Example:



Smeal Decision Matrix – "Two-piece" refers to a new two-course set in sustainability for undergrads. "PSEP" stands for Penn State Executive Programs. This was excerpted from the Smeal Sustainability Plan available at: *sustainability.psu.edu/guidebook*.

SMART Goal Builder

What are SMART goals? SMART goals are:

Specific: Is the goal detailed enough with clear objectives* and action steps that someone who isn't a part of our team would know what needs to be done and how?

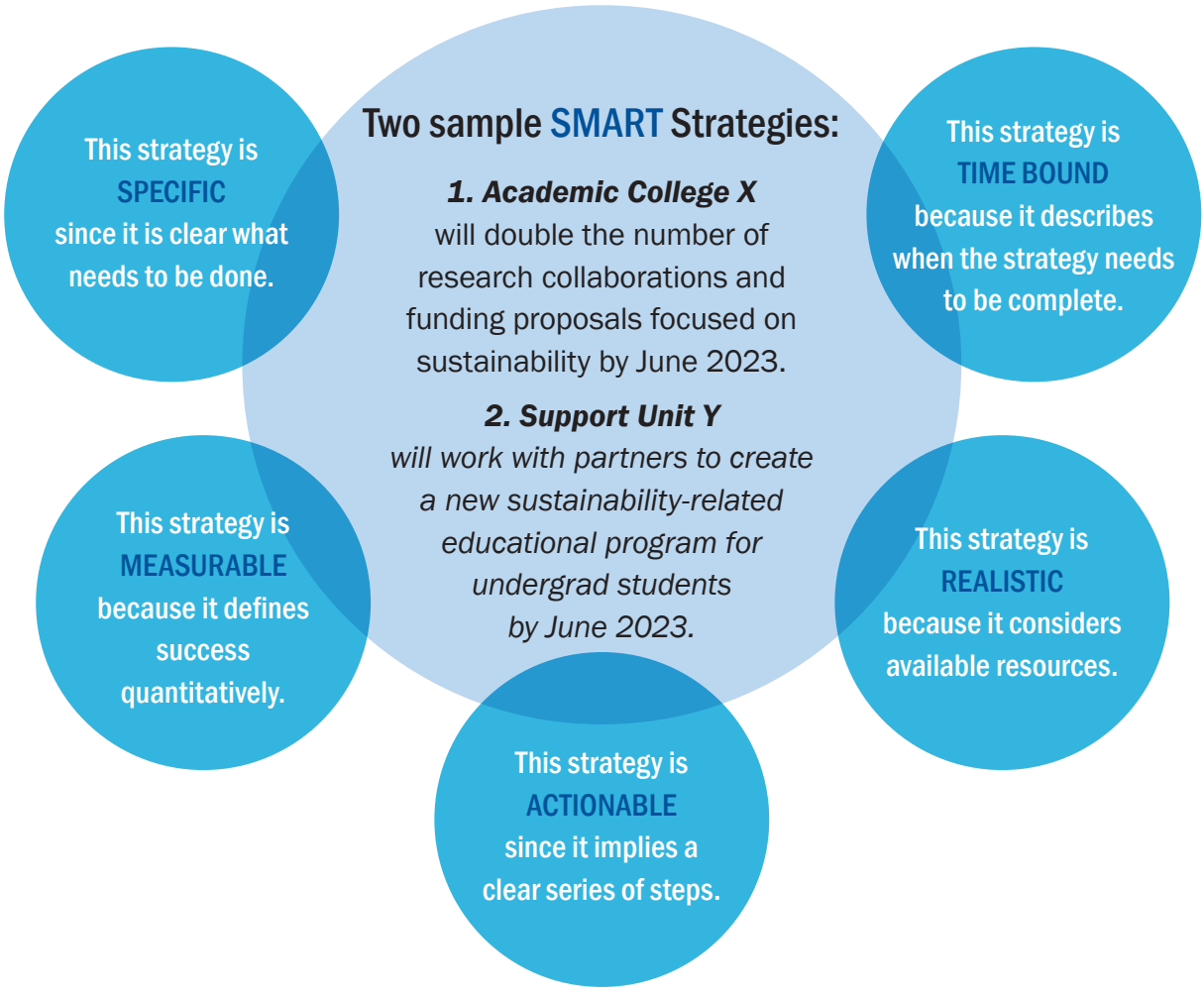
Measurable: Is there a clear way to measure success with defined key performance indicators (KPIs)? How will you know when you've reached your goal?

Actionable: Is there a clear series of action steps to take to accomplish your strategy?

Realistic: Is it possible to reach this strategy considering the resources available to your team?

Time Bound: When will the strategy be accomplished?

** An Objective helps you set a direction for the achievement of your Goals. It is made up of Key Performance Indicators, Action Items, and Metrics. One Goal can have multiple Objectives, but an Objective is always tied to a singleGoal (and therefore maps up to the Unit Mission). An Objective answers the question "How do we know we're making progresstowards our Goal?"*



Worksheet

You may want to make more copies of this worksheet for your planning team.

1. Write a rough version of the strategy or goal here:

2. To which University thematic priority or foundational element does this goal align?

3. Use the insights gained above write your unit's SMART goal.

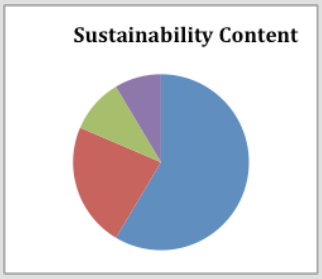
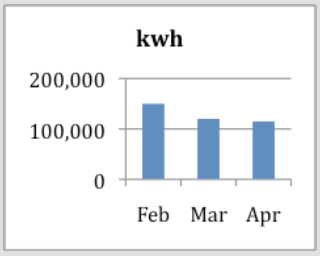
You can write drafts of your goal statement here. Keep trying different versions until it is clear and meets the SMART goal framework. Finally, be sure to decide who is responsible for making the strategy happen.

4. Repeat this process for each SMART goal.

Worksheet

Metrics Worksheet[10]: The saying "what gets measured, gets managed" holds true for sustainability. Effective integration of sustainability leads to strategies that are measurable and accountable. The Metrics Worksheet below is a tool to help you develop your metrics/key performance indicators (KPIs).

Most columns are probably self-explanatory except for "Sample Chart," which encourages teams to identify early how data will be presented. Teams can work backwards from what the chart or table will look like to what kind of data they need and how they need to collect it. The table can be easily recreated in Excel or a similar program. Make sure you develop good metrics and a way to track and report on them.

Metric/KPIs	Ultimate Goal	Baseline	Source of Data	Sample Chart
Academic example: Percentage of courses in strategic areas within our dept/college with sustainability content	45% by 2023	10% in 2013	Internal survey	
Support Unit example: Monthly electricity consumption	50% reduction by 2023	150,000kwh/ month	Office of Physical Plant	

[10]Hitchcock, Darcy E., and Marsha L. Willard. The Step-by-step Guide to Sustainability Planning: How to Create and Implement Sustainability Plans in Any Business or Organization. London: Earthscan, 2008

Before You Go On!

Go back to page 7 and write your conclusions in *Step 5*.

STEP 6 Develop Your Implementation Plan

It's all talk unless there is an implementation plan to make it all happen. Who is going to do what? By when? How will you assess effectiveness? After finishing this section, you will have:

- A plan to develop the proper support systems around your strategies
- An implementation plan to ensure clear responsibilities, timelines, and budgets

Establishing Support Systems

DON'T SKIP THIS STEP. You would not build a house on a faulty foundation. Beneath your new sustainability plan, you need a strong foundation of support systems. Without such a foundation, your investment to create a solid plan (Steps 1-6) could be at risk.

"Support systems" refers to the various administrative structures, policies, and communications that focus and build capacity within an organization to carry out the work. These are the key enablers of your sustainability plan. If you leave sustainability unresourced, isolated, and without accountability, it will wither. ***On the other hand, if sustainability has a prominent seat at the table, is an obvious and visible part of the organizational structure and culture, and is properly resourced, it will succeed.***

This is where you consider and make decisions about questions like:

- Have formal structures been put into place like a Sustainability Council or work group with representatives from various departments?
- What new policies, systems, or standards may be needed or old ones amended to support your sustainability goals?
- Whose support inside and outside the organization will we need to be successful? And how will we make sure they are aware and "on board" with our sustainability goals?

These critical questions will be answered by addressing four parts of your support system:

- Organizational structure and policies
- Team learning and innovation
- Communications
- Reporting and accountability

Tip for the Facilitator

Once you have your goals and metrics finalized, put them in writing in a document underneath the vision statement. Show this to the group to demonstrate that progress is being made. It is recommended that someone draft an implementation plan with objectives and actions or at minimum an outline. Bring a drafted plan to a meeting and do a simple "plus/delta." "Pluses" are the document's strengths and "deltas" are opportunities to make it even better. Be sure to get formal approval from your top leadership.

Above and beyond: Schedule quarterly meetings to monitor implementation and make sure it is on the calendar of all the main people responsible for different strategies. Have the appropriate unit leader present at these meetings so she/he is kept informed of progress.

Organizational Structure and Policies: *the Right People*

Your unit surely has a number of committees, councils, advisory boards, task forces, etc. that have various responsibilities. These groups have regular meetings and key topics they analyze, discuss, and make decisions or recommendations about. The key issue here is how sustainability will be built into this organizational structure.

Effective approaches that some units have taken include:

- Create a new Sustainability Council that will be responsible for implementing this plan, guided by a formal charter and supported by the unit's leadership. The SI has an established network of Sustainability Councils that share learnings and all unit Councils are invited to join. See ***sustainability.psu.edu/councils*** for several example charters.

- Tap into the experience and knowledge from any existing Green Teams or sustainability committees in your unit and leverage them as appropriate.
- On an existing committee, create a chairperson for sustainability who reports on progress, identifies obstacles, and convenes conversations when needed.
- On an existing committee, create a subcommittee focused on sustainability.

Units have a number of formal and informal policies, standards, and norms—some from the unit and some originating from the university. These can support, impede, or not apply to your new sustainability plan. For example, promotion and tenure criteria may inadvertently discourage applied sustainability research. Faculty may not get credit for applied projects that may provide sound learning outcomes and benefit to the community or campus but don't satisfy a peer-reviewed publication or "service to the university" requirement. On the other hand, the same promotion and tenure criteria can actually advance sustainability research by ensuring its rigor and grounding in scientific principles.

Team Learning and Innovation: *the Right Understanding and Creative Environment*

Your unit already has a way to ensure that faculty and staff receive instruction or training on various topics, from managing TAs to using technology to leadership and communication skills. Sustainability also requires new skills, knowledge, and values. The specific type and content of faculty or professional development depends on the unit and your sustainability goals.

Examine your goals and consider the skills and knowledge required to realize them. Do those skills and knowledge exist within the people who are responsible for implementing the plan? If so, how could they be enhanced? Could sustainability goals be incorporated into annual performance management goals? If not, how could they be acquired? What resources exist in the college, campus, or at Penn State that could help? Consider tapping into the Sustainability Institute's faculty, staff, and student programs.

Sometimes it is not necessarily skills and knowledge that is needed but partnerships and space for reflection and innovation. Perhaps one or more of your goals will require new partnerships with faculty or staff in other areas, groups in the community, or external agencies, businesses, or organizations.

What if you had a meeting of faculty, dining service employees, local farmers, and social workers to explore ways to develop a local food program that provided nutrition to low-income populations while providing learning and research opportunities for students?

What if you had monthly Innovation Labs, where faculty or staff met during an afternoon or morning about a strategic sustainability topic? Using brainstorming, small group work, and personal reflection, all types of new ideas and process improvements would emerge.

Communications: *the Right Message and a Way to Listen*

Your unit probably has a number of ways for communicating information: website, social media, fundraising letters and meetings, alumni newsletters, emails, bulletin boards, meetings, and special events. ***Consider how your new sustainability goals and commitment can be featured and highlighted regularly in these communications.***

How does our Green Team play a role?

It depends on your unit and your goals. In general, we say that Green Teams play the critical role of improving day-to-day operations. Strategic planning is focused on longer term initiatives tied to the unit's core mission. Both are needed.

What are Green Teams?

Penn State Green Teams are groups of faculty, staff, and students who take specific actions to help their organization (college, department, building, etc.) operate in a more efficient, innovative, and healthy way. Penn State has Green Teams at nearly every campus. Learn more at our website: *sustainability.psu.edu/GreenTeams*

Some general communication tips for sustainability:

- Communications includes listening to internal and external stakeholders via meetings, surveys, etc.
- Work with your leadership to determine the key messages and types of communication you want to incorporate into your traditional communications.

Be able to fill in the blank: "The most important message (name of leader) wants to communicate about sustainability is

_____

_____."

Note that she/he may have a slightly different message for different audiences, so be sure to list messages by audience. The message to students could and should be a little different from the message to staff or faculty or alumni.

- Keep finding fresh, positive new ways to communicate this message.
- Always relate the stories to the unit's core mission and priorities.
- Be sure to show the breadth of what sustainability represents: social, economic and environmental dimensions.
- Articles posted to Penn State News that are tagged with "sustainability" are automatically pulled into the Sustainability Institute's Mainstream newsletter.

Evaluation, Reporting & Accountability Processes: *the Right Measurement*

Your unit already has a regular schedule and process to gather quantitative and qualitative data in a number of areas: research publications, student learning, customers served, project costs, etc. And you have a way to share this information internally and externally.

How will you incorporate sustainability into these existing measurement and reporting processes?

To ensure long-term support and success, you will need to be able to make a rigorous, evidence-based case for the unit's strategic sustainability efforts. Be prepared for this kind of critical analysis by putting in place a program evaluation plan at the outset. Return to Step 5, "Set Goals and Develop Metrics," and develop your evaluation plan using the metrics you developed.

Image: Penn State

Worksheet

Support Systems Checklist

Check off the following once you have ensured that these critical support systems are in place to support the realization of your goals.

☐ **Organizational Structure and Policies**

You have decided how sustainability will be built into your organizational structure, decision-making processes, and policies.

☐ **Team Learning and Innovation**

You have decided what system you will put into place to ensure team learning, reflection, and focus on innovation.

☐ **Communications**

You have a communications plan to ensure sustainability and the various strategic initiatives put into place are an important part of your leadership's message and the unit's communications. Likewise, you have a plan to listen regularly to the needs and concerns of key stakeholders.

☐ **Evaluation, Reporting and Accountability**

You have decided how you will incorporate sustainability into new or existing measurement and reporting processes and schedules.

Worksheet

Implementation Template

Here is where you put it all together. Ensure that each strategy has someone capable who is responsible for getting it done within a certain timeframe.

Your unit probably has its own way of developing implementation plans or action plans. Some methods are more formal than others. The "template" below can be recreated in Excel or a similar program. Likewise, the same categories could be created in a Word document. The most important thing is to have these categories accounted for because they force you to be clear and specific about how you will carry out your goals.

Goal	Objectives w/Action Steps	Who	Timeframe	Metric	Budget

Before You Go On!

Go back to page 7 and write your conclusions in *Step 6*.

Appendix & Resources

More information on all these resources can be found at **sustainability.psu.edu/guidebook**

Definitions of sustainability research, courses and public engagement

The source for the following definitions, unless otherwise noted, is the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment and Reporting System (STARS) assessment tool. More information at: *https://stars.aashe.org*

Sustainability Research

AASHE definition:

Sustainability research is research that leads toward solutions that simultaneously support social wellbeing, economic prosperity, and ecological health. It includes academic research that:

- Explicitly addresses sustainability and/or furthers our understanding of the interconnectedness of social, economic and environmental issues;
- Contributes directly toward solving one or more major sustainability challenge (e.g. contributes toward achieving principles outlined in the Earth Charter); and/or
- Engages community members with the aim of combining knowledge and action to achieve positive social, economic and environmental outcomes (e.g. participatory and community-based research and engaged scholarship).

Image: Penn State

Image: Penn State Behrend

Image: Penn State

Sustainability Courses

AASHE definition:

"Sustainability courses are courses in which the primary and explicit focus is on sustainability and/or on understanding or solving one or more major sustainability challenge (e.g. the course contributes toward achieving principles outlined in the Earth Charter). This includes:

1) Foundational courses in which the primary and explicit focus is on sustainability as an integrated concept having social, economic, and environmental dimensions. Obvious examples include Introduction to Sustainability, Sustainable Development, and Sustainability Science, however courses may also count if their course descriptions indicate a primary and explicit focus on sustainability.
2) Courses in which the primary and explicit focus is on the application of sustainability within a field. As sustainability is an interdisciplinary topic, such courses generally incorporate insights from multiple disciplines. Obvious examples include Sustainable Agriculture, Architecture for Sustainability, and Sustainable Business, however courses may also count if their course descriptions indicate a primary and explicit focus on sustainability within a field.
3) Courses in which the primary focus is on providing skills and/or knowledge directly connected to understanding or solving one or more major sustainability challenges. A course might provide knowledge and understanding of the problem or tools for solving it, for example Climate Change Science, Renewable Energy Policy, Environmental Justice, or Green Chemistry. Such courses do not necessarily cover "sustainability" as a concept, but should address more than one of the three dimensions of sustainability (i.e. social wellbeing, economic prosperity, and environmental health).

Courses that include Sustainability:

While a foundational course such as chemistry or sociology might provide knowledge that is useful to practitioners of sustainability, it would not be considered a sustainability course. Likewise, although specific tools or practices such as GIS (Geographical Information Systems) or engineering can be applied towards sustainability, such courses would not count as sustainability courses unless their primary and explicit focus is on sustainable applications. If there is a sustainability unit, module or activity within one of these courses, but it is not the main focus, the course may be counted as a course that includes sustainability."

Sustainability Public Engagement

AASHE Definition:

Formal community partnerships are purposeful, lasting, mutually beneficial relationships that link institutional resources with school districts, government agencies, non-profit organizations, NGOs, businesses and/or other external entities to work together to understand and address the core problems facing local communities. Successful community partnerships strengthen the capacity of both institutional and community partners to build healthy, just and resilient communities.[11]

[11]STARS 2.1 Technical Manual available at sustainability.psu.edu/guidebook. Page 107.

Resources offered by the Sustainability Institute

For more indepth information on the Sustainability Institute's resources: *sustainability.psu.edu*

The Sustainability Institute at Penn State, along with partners, offers a variety of programs that can assist units with integrating sustainability into their teaching, research, operations, outreach and literacy development. For more information on these programs, visit the website sustainability.psu.edu.

Sustainable Communities Collaborative (SCC)

The Sustainable Communities Collaborative (SCC) connects University faculty, students, and staff with community partners to address sustainability challenges through collaborative projects. The collaborations are geared toward engaging PSU faculty and students with community organizations in need of their own sustainability solutions. Each project is a facilitated effort, involving faculty and student expertise, and co-led by a key community leader and the SI's SCC staff, to help develop and support thriving, healthy communities and advance student learning about the scholarship of sustainability. Over the past year, the SCC has assisted with over 70 community projects matched with classes at the University Park and several Commonwealth campuses and involving over 1,000 students.

What this could mean for you

Assistance making connections to the community and guidance on incorporating this into your college, campus, or just a course. This program could be replicated at other campuses.

Sustainability Experience Center (SEC)

The nine-acre Sustainability Experience Center (SEC), coordinated by the Sustainability Institute, lies on the edge of Penn State's University Park campus and provides a living laboratory for students, faculty, and the community to research and learn about sustainability. The site provides an ideal location to explore food, energy, water, land and community systems. The site is home to the Morningstar home, a 100% renewable-energy powered home, the campus Community Garden and multiple ongoing research and outreach projects hosted by various departments and colleges in the University.

What this could mean for you

At University Park, it is a place to bring students or to do research. If you are away from UP, it can be worth the trip to visit.

Sustainability Leadership Minor

The Minor in Sustainability Leadership is for students who are promoting environmental, social and economic sustainability. The program helps students develop key competencies in systems thinking, application of sustainability concepts, metrics and analysis, ethics, self-knowledge and leadership, change agency and collaboration that cut across all tracks.

What this could mean for you

A minor for students to gain a broader understanding of sustainability and an opportunity to add your course to those that students can take for the minor.

The Sustainable Food Systems Program

This Program (SFSP) and the Student Farm at Penn State provide a living laboratory for engagement in sustainable food and agricultural systems. The program links classroom education with experiential learning, student-led research and community outreach. The SFSP is a launching point for conversation about many issues, including food security, food waste and other pressing issues of our time.

What this could mean for you

Students at many Penn State campuses can expand their understanding of food systems through SFSP and several campuses also host gardens connecting students and community.

Faculty Development Workshops in Sustainability

Faculty development workshops at Penn State fall into two main categories: shorter workshops held during the semester and multiple-day workshops for faculty who wish to create new sustainability-focused courses. In both cases, we work with faculty to help them find ways to incorporate more sustainability concepts and practices into coursework across disciplines.

What this could mean for you

An opportunity for faculty to meet with and learn from other faculty.

Penn State EcoReps

Penn State EcoReps are student educators for sustainability at Penn State's University Park Campus. Through a focus on educating first year students in East and Pollock residence areas, EcoReps communicate Penn State's commitment to sustainability from students' very first day on campus. Housing's EcoReps program consists of frequent building outreach events by EcoRep groups and 6 large, team-wide events throughout the year.

What this could mean for you

This great program for students is at University Park right now but could be replicated at any campus.

Green Teams Program

Green Teams are groups of faculty, staff, and students volunteering to take specific actions to help their unit (college, department, building, etc.) operate in a more efficient, innovative, and healthy way. Typically, Green Teams focus on making their operations more sustainable through either specific projects or using the easy to follow Green Paws Program.

Green Paws Office Certification Program

The Green Paws Program is a simple, yet effective way for groups in offices to "green" their workspace and earn a Green Paws Office Certification for their efforts. The Program is organized into four levels of certification that signify an office's progression towards higher and higher levels of efficiency, health, and environmental sustainability. Over 2,300 faculty and staff have participated in the Green Paws Program.

What this could mean for you

Green Teams and *Green Paws* are off-the-shelf programs with many tools developed for taking meaningful action.

If you are looking for a way to get sustainability incorporated into the culture of your unit and into the day-to-day operation...these are for you.

SI Affiliates Program

Through this Program, the Institute supports and amplifies the work of faculty, staff, students and stakeholders who are researching, developing and implementing sustainability solutions, or creating art or teaching in ways that promote sustainability. This program increases access to and awareness of the faculty, students, staff and community stakeholders at Penn State who are engaged in sustainability efforts and helps connect a diverse network of local, regional and global communities.

What this could mean for you

As the Affiliate Program expands, it promotes co-creation of ideas and solutions throughout the University.

Image: Penn State

Resources available at sustainability.psu.edu/guidebook

On that website, you will find a host of resources that augment this guide, including:

- The 2030 Agenda for Sustainable Development Primer.
- A Discussion Guide for introducing the Sustainable Development Goals.
- Getting Started with the SDGs in Universities: A Guide for Universities, Higher Education Institutions and the Academic Sector.
- Case studies for units that have used the guidebook to create sustainability plans with key lessons outlined.
- An Opportunity Finder to supplement the Maturity Model worksheets. This set of questions will assist units with developing a baseline of their current sustainability efforts and identify new opportunities to a greater extent than with the maturity model questions. Using this resource nurtures a holistic view of your units activities.
- A Chronology of Sustainability Milestones at Penn State.
- The 2012 Sustainability Strategic Plan.
- The 2016 – 2025 Penn State Strategic Plan, *A Commitment to Impact.*
- A List of existing Sustainability Councils and their charters.

Polar explorer and environmentalist Robert Swan once said that "the greatest threat to our planet is the belief that someone else will save it." In 2015, 193 countries pledged, through their support for the 17 Sustainable Development Goals, to pursue "sustained and inclusive economic growth, social inclusion, and environmental protection, fostering peaceful, just and inclusive societies through a new global partnership."[12] We now see corporations, municipalities, and universities joining in this effort. Through their education, research, innovation and leadership, higher educational institutions, such as Penn State, have an essential role to play. We hope that with the help of this guidebook, you will lay out the plan for your role. Just remember Margaret Mead's advice…

"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has."

[12]2030 Agenda for sustainable development goals primer

Design and Illustration by Graphics and Design, State College PA

This publication is available in alternative media on request. The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the University to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, gender identity, or veteran status. Discrimination or harassment against faculty, staff, or students will not be tolerated at The Pennsylvania State University. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Director, The Pennsylvania State University, 328 Boucke Building, University Park, PA 16802-5901; Tel 814-865-4700/V, 814-863-1150/TTY. U.Ed. OPR14-05

PennState sustainability INSTITUTE

sustainability.psu.edu

ALCOA Made possible in part by a grant from Alcoa Inc.