THE OHIO STATE UNIVERSITY
SUSTAINABILITY INSTITUTE

Ohio State Sustainability Fund

FY 2021 ANNUAL REPORT

Overview

The Ohio State Sustainability Fund was established to support improvement of the sustainability profile of the university — through efforts that improve campus operations and lead to increased learning and innovation or more sustainable behaviors in the university community.

The Sustainability Institute (SI) manages the Ohio State Sustainability Fund (OSSF). Since 2010, the OSSF has invested over $10 million in a variety of project types. In FY 2021, the OSSF provided over $300,000 in project and new research support, which included projects that extended beyond the fiscal year calendar. Funding requests were presented to the President and Provost's Council on Sustainability (PPCS) for discussion prior to any final funding decisions.

In a year slowed by the university's response to the COVID-19 pandemic, the OSSF committed funds for one campus-based project and numerous research initiatives in FY 2021, including a research seed grant program to boost knowledge across multiple different sustainability topics.

As in the past, some of the OSSF investments are expected to result in quantifiable operational cost savings for the university or leverage new sustainability funding investments to the university. While many of the FY21 OSSF investments are still underway, the campus-based investment made possible a considerable in-kind stormwater management infrastructure donation to the university.

To date, investments of the OSSF have generated a cumulative annual cost savings exceeding $1.7 million. This is well above the annual OSSF funding amount and returns a financial net positive result to Ohio State.

Project Funding Guidelines

Guidelines for the eligibility and selection of projects the OSSF supports are summarized below. Proposals are reviewed and considered individually and in light of all other funded projects and pending proposals. Proposed projects must address the eligibility criteria below. The individual projects that best meet the eligibility criteria are then evaluated for funding support in consideration and comparison to all previously funded projects and pending proposals.

Eligibility guidelines: Individually, does the proposed project meet the following criteria:

- Contribute to sustainability – Projects improve the sustainability of campus operations and/or improve the sustainability awareness of campus populations.
- Campus impact – Projects are restricted to Ohio State campuses and must be led by a staff or faculty member.
- Existing university operating budget – Projects that are covered by an existing university operating budget are not eligible. Projects and project funding are not intended to be an alternative path to the normal annual budgeting process.
- Partial funding support – The Sustainability Fund should be used to seed, catalyze, or gap-fill funding on projects rather than be the sole funding source. The fund may be used to support the launch of a program but not for regular year-over-year programmatic funding.

Selection Evaluation Guidelines: Relative to previous projects and all other pending project proposals:

- Feasibility – Is the project likely to succeed? Has the project accounted for contingencies and major obstacles?
- Sustainability Impact – Does the project measurably improve or accelerate the sustainability of Ohio State's campuses or the realization of Ohio State's Sustainability Goals and priorities?
- University Population Impact – Does the project lead to increased understanding, greater engagement, or sustainable behavior change in the university community?
- Economic Impact – What are the financial benefits? What are the cost savings, return on investment, or payback over time? Positive return on investment is strongly encouraged.
- Innovation – Does the project exhibit innovative technology, processes, or application of knowledge?
- Institutionalization/Scalability – Can the project become embedded in the University's routine operation? Does it need only startup funding to then sustain itself over time? Can it be expanded to other campus locations if successful?

Project Selection

SI receives and seeks project proposals from across the university including colleges, student groups, regional campuses, research centers, Student Life, Facilities Operations and Development, Wexner Medical Center, and Athletics. SI continually reviews projects throughout each fiscal year.

Following a review by SI, recommended projects are presented to the President and Provost's Council on Sustainability (PPCS) for further review and consideration. Projects receiving a concurrence from the PPCS are then awarded funding.

Featured FY21 Funded Projects

SUSTAINABILITY RESEARCH SEED GRANTS
$125,000

The Sustainability Research Seed Grant program lays a foundation for convergence research, a means of solving vexing problems through interdisciplinary collaboration — particularly complex problems facing society. The program builds capacity in sustainability and resilience research at Ohio State.

This year, research teams for the approved seed grants include Ohio State faculty from 14 academic departments, University Libraries, Ohio State Extension educators and community partners. These interdisciplinary teams will explore sustainability in air, agriculture, water and energy.

This year's seed grant awardees:

Accelerated discovery of long-life organic electrode materials for **sustainable energy storage** with active machine learning. This project aims to use state-of-the-art active machine learning methods to accelerate the discovery of new battery materials based on abundant elements, such as carbon, nitrogen, oxygen and sulfur, which can provide a more economical and sustainable route to renewable energy storage.

Assessing the impacts of cover crops on the **sustainability of agricultural production systems** using remote sensing and machine learning. This project leverages satellite-based remote sensing and in-situ crop and soil data to assess the role of cover crops on the sustainability of agricultural production systems under varying weather and management conditions.

Estimating exposure and health impacts of **traffic-related air pollution** during daily travel. Few studies have investigated the health impacts of on-/near-road PM2.5, or inhalable particles generally 2.5 micrometers and smaller, during daily mobility due to the lack of fine-grained spatio-temporal data. This project proposes measuring and predicting PM2.5 concentrations and surveying health outcomes of study participants to estimate the physical and mental health impacts from everyday exposure to on-/near-road PM2.5.

Ohio's coal transition: pathways for community resilience. Combining social science, engineering, theatre and art, this project proposes to document and understand impacts of the transition away from coal on three Ohio communities. The academic, applied and creative outputs will inform policies, planning, programs and design aimed at bolstering community resilience in these communities and beyond.

Sustainability assessment of upcycling anaerobically digested organic waste into **sustainable sodium-ion battery materials** for distributed power solutions. This project evaluates the sustainability of an innovative distributed power generation and storage solution integrating an aerobic digestion and combined heat and power system with hydrothermal carbonization and sodium-ion battery systems to utilize community-generated organic wastes to produce heat and electricity and store the excess power for community use.

Developing **water supply curves for the food-energy-water nexus**. This research lays the groundwork for a cross-sectoral circular water economy (CWE) by compiling water quantity and quality data, modeling wastewater treatment, and interviewing water managers insights. A CWE, where wastewater is treated and reused, is more sustainable than the present linear approach where treated wastewater is discharged.

SUSTAINABILITY GOALS ADVANCED BY PROJECT

- Encourage new sustainability knowledge and solutions
- Foster sustainability culture on and off campus
- Encourage local and global sustainability partnerships

INNOVATION PLAZA STORMWATER MANAGEMENT

$43,862.50

Stormwater management is a significant economic and environmental issue when designing new construction. Stormwater runoff from developed areas carry numerous pollutants to surface water bodies (lakes, rivers, etc.); often raises the temperature of the receiving surface water body, negatively affecting aquatic life; and deprives groundwater recharge through methodical absorption of stormwater into the soil. Climate change further exacerbates this issue by increasing the number and intensity of stormwater events.

The transformation of West Campus at Ohio State's Columbus campus has begun to take shape around the developing Innovation Plaza. To move forward with planned development, the university is required to manage the additional stormwater runoff from the new development in a manner that protects area surface waters and surrounding infrastructure.

The Innovation District development provides an opportunity to install an advanced, state-of-the-art stormwater management system that meets regulatory requirements while improving water quality and providing a new on-campus living laboratory to conduct ecosystem service research and engage students in new learning opportunities.

In partnership with Ohio State's Office of Planning, Architecture, and Real Estate and Sustainability Institute, Advanced Drainage Systems (ADS) has donated the installation of two stormwater management systems (StormTech) that include 204 large storage chambers, and the associated piping, to drain some of the current and planned future development around the Innovation Plaza. StormTech systems provide advanced stormwater filtration capabilities, providing for cleaner water as it leaves the site. In addition, this approach minimizes the use of land dedicated to a traditional surface water retention pond, enabling some of that land to be utilized for other more valuable purposes.

In conjunction with this partnership, ADS is considering additional financial support for Ohio State researchers and students for multiple campus-based research opportunities, including studying feasibility of using the donated systems' captured stormwater for landscape irrigation (saving potable water use and cost), among other sustainability research opportunities on campus.

The OSSF investment was used to update the site's engineering plan to incorporate the donated StormTech systems.

SUSTAINABILITY GOALS ADVANCED BY PROJECT

- Teach sustainability in innovative ways in and out of the classroom
- Encourage local and global sustainability partnerships
- Increase campus ecosystem services

Sustainability Fund Projects
FY 2016-2021

2016	Funding	Savings/Year
LED lighting for B. Davis, J. Owens, and Buckeye Field Stadiums	$150,000	$8,367.24
Recycling Infrastructure Expansion and Standardization	$150,000	NA
University Organics Hauling Vehicle	$345,260	TBD
CNG Filling Station – Construction Budget Support	$500,000	TBD
Center for Ethics and Human Values – Sustainability Project	$144,000	NA
Collaborative to Reduce and Redirect Consumer Food Waste	$27,500	NA
Reusable Hot/Cold Beverage Cup Program	$200,000	NA
AASHE STARS – Carbon Footprints for Regional Campuses	$18,000	NA
Ohio State-Lima Campus Hybrid Electric Car	$17,000	$250
Hot Water Pipe Upgrades	$171,000	TBD
FY 2016 Totals	**$1,722,760**	**TBD**

2017	Funding	Savings/Year
Zero Waste Goals	$53,000	TBD
Water Bottle Refilling Stations	$93,200	NA
Mansfield Campus Micro-Farm	$100,000	TBD
Marion Campus Solar Energy Installation	$62,450	TBD
Electronic Landscape Irrigation Control	$25,000	TBD
FY 2017 Totals	**$333,650**	**TBD**

2018	Funding	Savings/Year
Alternative Fuel Vehicle Incentive	$500,000	TBD
Fleet EV Charging Infrastructure	$375,000	TBD
Ultra-Cold Freezer Pilot	$263,728	TBD
BioSciences Greenhouse Energy Curtains	$190,000	TBD
Student Farm: Sustainable Food & Farming Systems	$94,741	TBD
Once Through Water Usage	$73,203	$131,123
Climate Action Plan	$71,153	NA
Food & Organic Waste Inventory & Demonstration Project	$64,596	TBD
Lower Olentangy Sustainability Plan	$60,000	NA
Grounds For All	$43,000	$8,500
Campus Sustainability Signage	$25,000	NA
EvoBin Research	$21,000	TBD
Artificial Floating Island Test Garden	$15,000	NA
FY 2018 Totals	**$1,769,421**	**TBD**

2019	Funding	Savings/Year
Stormwater Management Plan	$20,950	NA
Grounds for All Supplemental	$12,000	NA
Sustainability Online Map	$8,500	NA
Mansfield Campus Exterior LED Light Conversion	$81,464	$8,900
Sustainability in Anesthesia Clinical Practice	$30,000	TBD
WMC Data Center Battery Bank	$80,000	$10,700
Behavioral Energy Conservation Living Lab	$308,117	TBD
Innovating Organic Waste Solutions	$169,280	TBD
Columbus Campus Urban Heat Island	$149,905	NA
Zero Waste Hand Dryer Phase II (first installment)	$200,000	$145,000
FY 2019 Totals	**$1,060,216**	**TBD**

2020	Funding	Savings/Year
Enhancing Campus Soil-Ecosystem Services	$66,131	NA
Zero Waste Hand Dryer Installations–Phase II (2nd installment)	$200,000	$145,000
Waterman Walks	$15,000	NA
Cannon Preserve Supplemental Tree Planting	$129,351	NA
ARTrees	$29,200	NA
Classroom of Tomorrow	$90,000	NA
Sustainability Research Seed Grants	$125,000	NA
Water Reclamation Study	$43,600	TBD
Energy Storage as a Service	$89,814	NA
Multidisciplinary Capstone Projects: Active Window & PV Building Integration	$30,000	NA
FY 2020 Totals	**$818,096**	**TBD**

2021	Funding	Savings/Year
Innovation Plaza Stormwater Management	$43,862.50	TBD
Sustainability Research Seed Grants	$125,000	NA
Targeted Research Investments	$15,000	NA
Sustainability Research Focus-Area Investments	$39,635	NA
Faculty Research Leads	$90,000	NA
ESS Lab Manager Support	$14,000	NA
FY 2021 Totals	**$327,497.50**	**TBD**

Fiscal Years 2010–2021 Summary	Total Investment	Annual Cost Savings*
118 funded projects	$10.4 million	$1.7 million

* NOTE:
Efforts to quantify the cost savings for 2016-2021 projects are ongoing and will be reported as it becomes available.

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