Iowa State University Strategic Plan for Sustainability in Operations 2021-2025

In 2008, Iowa State announced the Live Green! Initiative. Successfully focusing on engaging students, faculty and staff in a sustainable future, the University achieved recognition including AASHE STARS* Gold certification and the Princeton Review's Top 50 Green Colleges.
The decade since the start of Live Green! has seen a growing awareness of the impacts of climate change, and national and international reports that demonstrate the need to reduce greenhouse gas emissions.

The following Sustainability Plan for Operations, advised through resolutions from Faculty Senate and Student Government and the recommendations of the Advisory Committee on Sustainability, guides focused commitment to reducing carbon emissions, reducing energy consumption and applying cohesive and overarching sustainability procedures to day-to-day operations.

This plan focuses on five areas of operations, based on two primary considerations:

1. Sustaining our STARS Gold certification, and striving to achieve Platinum certification.
2. Pursuing sustainability opportunities through cost-neutral measures.

Within this plan, the five focus areas of operations (university energy use, building operations and maintenance, waste and recycling, water use and grounds maintenance) are guided by two overarching performance goals:

- Achievement of a 50% reduction of university greenhouse gas emissions by 2025 through ending the use of coal, improving building energy efficiency and tripling the use of renewable energy.
- Development of university-wide plans and procedures to improve sustainability of day-to-day operations and maintenance of all campus facilities within operational areas of building operations and maintenance, waste and recycling, water use and grounds maintenance.

Strategies for each of the focus areas are outlined and discussed in the proceeding document. For each strategy, action items, timelines, resource investment, operations impact and justification and STARS credit impact are included and detailed.

*Association for the Advancement of Sustainability in Higher Education Sustainability Tracking, Assessment and Rating System

I. Energy Strategies

- **OP-1/OP2 Emissions Inventory and Disclosure/Greenhouse Gas Emissions – 11 points available, ISU 2019 submission points: 3.16/11.00**
    - Recognizes institutions that have (1) inventoried and verified greenhouse gas (GHG) emissions, (2) reduced GHG emissions and achieved zero adjusted net emissions per capita and (3) reduced GHG emissions and achieved zero adjusted net emissions per floor space. Institutions earn up to 3 points for completed GHG inventories for Scopes 1, 2, at least six components of Scope 3 and air pollutant emissions. Institutions earn 4 points (each) for achieving zero adjusted net emissions based on both per capita and gross square foot/meter of floor space. Carbon offsets may be counted, but must be third-party verified. Incremental points can be earned.
- **OP-5 Building Energy Consumption – 6 points available, ISU 2019 submission points: 2.37/6.00**
    - Recognizes institutions that have implemented measures to reduce building energy usage. Institutions earn 3 points for reducing building energy consumption per gross square foot/meter of floor area by 50 percent and 3 points when annual building energy consumption is 90 percent or more below the minimum performance threshold. Incremental points can be earned.
- **OP-6 Clean and Renewable Energy – 4 points available, ISU 2019 submission points: .08/4.00**
    - Recognizes institutions that support the development and use of clean and renewable energy sources. Eligible systems include solar photovoltaic, solar thermal, wave and tidal power, wind power, low-impact hydroelectric power, agricultural crops and waste, untreated wood waste, animal waste, and landfill gas. RECs (renewable energy credits) can also be included. Institutions earn 4 points for generating or purchasing the equivalent of 100% of campus energy consumption through renewable sources. Incremental points can be earned.

The following targeted energy goals align directly with the above noted STARS credits and are closely interrelated. Improvements to impact one credit have the potential to also impact others as can be noted in each of the corresponding strategies tables for each goal.

A. Reduce Greenhouse Gas Emissions

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	Convert coal-fired boilers at power plant to burn natural gas	$14.0M	Estimated savings is $3.7M per year based on FY2019 energy prices. Simple payback of less than four years. Proposed to be funded by utilities reserve funds and internal university financing to be repaid by project savings.	FY2025	OP-1/OP-2: +1.41	35% reduction in GHG emissions (based on FY2012 STARS baseline). Eliminates coal as a fuel source for campus.

B. Reduce Building Energy Consumption

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	Establish University Energy Policy to reduce building energy consumption by 5% based on FY2012 STARS baseline. The following programs would be implemented to support this policy: • 1.1 Institute a temperature setback program for all campus buildings that includes programs such as temperature setpoint standards, operational standards for building systems during un-occupied hours, nighttime activity centers and other similar programs. • 1.2 Set Energy Usage Index standards for all building types. This standard would be used to prioritize energy conservation projects and as a goal for the design of new buildings and major renovations. • 1.3 Set building design standards in accordance with LEED gold certification standards and pursue	None	FP&M will use existing staff, as available, to develop and implement an energy policy and to implement the individual strategies. After full implementation, the estimated annual savings is $825,000.	FY2023	+0.51 OP-1/OP-2: +0.18 OP-5: +0.33	5% reduction in building energy consumption (based on FY2012 STARS baseline) and 3% reduction in GHG emissions (based on FY2012 STARS baseline). Increases efficiencies in operations of campus buildings, specifically targeting hours of operation. This strategy will take approximately 2 years to implement. The information related to operating costs and STARS points reflects full implementation of this strategy.

	opportunities as financially and functionally feasible. Ensure that building energy performance is a part of all building design discussions.					

C. Increase Clean and Renewable Energy

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	Purchase renewable energy credits (RECs) for most electricity purchased from conventional sources.	None	An estimated annual cost of $78,000 to purchase RECs is within normal utility weather variations. Therefore, this strategy has no impact on utility rates.	FY2021	+1.15 OP-1/OP-2: +0.86 OP-6: +0.29	15% reduction in GHG emissions (based on FY12 STARS baseline). This strategy would result in primarily renewable electricity being purchased for the ISU campus.

II. Building Operations and Maintenance Strategies

Primary Credits

- **OP-3 Building Operations and Maintenance – 5 points available, ISU 2019 submission points: 1.50/5.00**
    - Recognizes institutions that operate and maintain their buildings in ways that protect the health of building occupants and the environment. Credit criteria is based on institutions owning and operating buildings that are: 1) Certified under a green building rating system focused on the operations and maintenance of existing buildings, e.g. LEED ® : Building Operations + Maintenance (O+M), and/or 2) Operated and maintained in accordance with published sustainable operations and maintenance guidelines and policies that include one or more of the following: ● Indoor air quality (IAQ) management policy or protocol ● Green cleaning policy, program or contract ● Energy management or benchmarking program ● Water management or benchmarking program. Institutions earn 5 points for having all eligible building space certified at the highest achievable level under a rating system for existing buildings. Incremental points are awarded based on the percentage of building space that is certified at each level and/or maintained in accordance with sustainable operations and maintenance policies. Energy and water management and benchmarking programs include dashboards, analytics tools, and other mechanisms to assess performance, set goals, create and implement action plans, and evaluate progress.

Secondary Credits

- **OP-5 Building Energy Consumption – 6 points available, ISU 2019 submission points: 2.37/6.00**
    - Recognizes institutions that have implemented measures to reduce building energy usage. Institutions earn 3 points for reducing building energy consumption per gross square foot/meter of floor area by 50 percent and 3 points when annual building energy consumption is 90 percent or more below the minimum performance threshold. Incremental points can be earned.
- **OP-12 Electronics Purchasing – 1 point available, ISU 2019 submission points: .6/1.00**
    - Recognizes institutions that are supporting markets for environmentally preferable computers and other electronic products, specifically, EPEAT-registered products for desktop and notebook/laptop computers, displays, thin clients, tablets/slates, televisions and imaging equipment. Institutions earn 1 point for purchasing exclusively EPEAT Gold computers, tablets/slates, televisions and imaging equipment. Incremental points can be earned.
- **OP-22 Water Use – 4 points available, ISU 2019 submission points – .47/4.00**
    - Recognizes institutions that have reduced water use. This credit is weighted more heavily for institutions located in areas of water stress and scarcity and less heavily for institutions in areas with relative water abundance. Institutions (in areas of low and low to medium risk for water abundance) earn 1 1/3 points for reducing potable water consumption by 30 percent per weighted campus user compared to a baseline, 1 1/3 points for reducing potable water use by 30 percent per gross square foot/meter of floor space compared to a baseline and 1 1/3 points for reducing overall water use by 30 percent per acre/hectare of vegetative grounds compared to a baseline. Incremental points can be earned.
- **IN-9 Exemplary Practice - Green Laboratories - .50 points available, ISU 2019 submission points – 0.00/.50**
    - Recognizes institutions that have or participate in a green laboratory benchmarking certification program that covers at least three of the following: energy conservation and efficiency, water conservation and efficiency, chemical use and disposal, materials management (e.g. green purchasing guidelines), and training lab users on sustainable practices. Institutions earn .50 points for have in place or are participating in a green laboratory benchmarking certification program. No incremental points can be earned.

- **AC-8 Campus as a Living Laboratory – 4 points available, ISU 2019 submission points – 4.00/4.00**
    - Recognizes institutions that utilize their infrastructure and operations as living environments for multidisciplinary learning and applied research that advances sustainability on campus. This credit includes substantive work by students and/or faculty (e.g., class projects, thesis projects, term papers, published papers) that involves active and experiential learning. Institutions earn 0.4 points for each area covered, regardless of how many projects there are in each area, up to 4 points.

The goals listed below directly align with STARS denoted focal areas of building operations and maintenance as noted above based on principles of supporting Indoor Air Quality, Green Cleaning, Energy Management and Water Management. In being inclusive of all campus buildings, all strategies will specifically address relevant and value-added protocol for unique categories of space (laboratory, residential, office, etc.) as well as offering overarching protocol.

Achieving the below noted goals, will entail a variety of campus units to collaborate to advance these sustainable practices to align with STARS for uncertified space that is operated and maintained in accordance with published sustainable operations and policies.

The following targeted building operations and maintenance goals align directly with the above noted STARS credits and are closely interrelated. Improvements to impact one credit have the potential to also impact others as can be noted in each of the corresponding strategies tables for each goal.

A. Establish Energy Management Protocol for Building Operation and Maintenance

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	100% of campus space covered by energy management protocol. • 1.1 Identify current energy management toward development of energy-efficient best practices and policies with additional focus on laboratory and other specialized-use spaces. • 1.2 Develop education and awareness	Staff time to collect and benchmark current practices and procedures and combine into central document.	Staff time for annual review and monitoring and tracking of protocol practices and procedures.	Begin FY2021 Complete FY2023	OP-5: +0.33 (supports I.B.1)	Offers campus-wide consistent protocol for building operations and maintenance related to energy management. Ensures opportunity for increased and enhanced energy efficiencies and reduced operational costs for buildings. Engages students in campus operations sustainability projects and planning.

	programs to promote energy conservation and efficiency, with focus on seeking academic collaboration opportunities through curriculum and service learning. • 1.3 Include University Energy Policy as proposed in I.B.1.					

B. Establish Water Management Protocol for Building Operation and Maintenance

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	100% of campus space covered by water management protocol. • 1.1 Identify current water management toward development of water-efficient best practices and policies with additional focus on laboratory and other specialized-use spaces. • 1.2 Develop education and awareness programs to promote water conservation and efficiency, with	Staff time to collect and benchmark current practices and procedures and combine into central document.	Staff time for annual review and monitoring and tracking of protocol practices and procedures.	Begin FY2021 Complete FY2024	OP-3: +.5 OP-22: TBD Pending reduction goals (Supports IV.B.1)	Offers campus-wide consistent protocol for building operations and maintenance related to water management. Ensures opportunity for increased and enhanced water efficiencies and reduced operational costs for buildings. Engages students in campus operations sustainability projects and planning.

	focus on seeking academic collaboration opportunities through curriculum and service learning.					

III. Waste Management Subcommittee Strategies

- **OP-19 Waste Minimization and Diversion – 8 points available, ISU 2019 submission points – 5.13/8.00**
  - Recognizes institutions that are minimizing their production of waste, diverting materials from landfills and incinerators, and conserving resources by recycling and composting. Institutions earn 2.5 points for reducing their total waste generation by 50 percent or more compared to a baseline, 2.5 points for reducing total annual waste generation per weighted campus user by 90 percent than a minimum performance threshold and 3 points by diverting 100 percent of waste from the landfilling through recycling, composting, donating or re-selling or by diverting at least 90 percent of waste from the landfilling and disposing of the remaining residual materials (up to 10 percent) through post-recycling conversion, including refuse-derived fuel (RDF). Incremental points can be earned.

The following recommendations are framed around actions benchmarked by STARS, toward achieving zero waste, and prescribed by the Environmental Protection Agency's Waste Management Hierarchy, which is also referenced in the State of Iowa Code.
In achieving the below noted goals, campus units will collaborate to advance waste prevention and divert non-hazardous construction and demolition debris and non-hazardous solid waste debris, including food and compostable material, and to pursue opportunities toward a goal of 85% net-zero waste by year 2025. That is, 85% of campus waste is diverted and does not enter a landfill.

The following targeted waste goals align directly with the above noted STARS credits and are closely interrelated. Improvements to impact one credit have the potential to also impact others as can be noted in each of the corresponding strategies tables for each goal.

A. Reduce Waste Generation

	Strategy	Capital Investment	Δ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	Decrease waste generation by 10% based on FY2012 STARS baseline. • 1.1 Identify opportunities for improvement within current campus policies and processes for	Staff time to collect and benchmark current practices and procedures and pursue further opportunities.	Staff time for annual review and monitoring and tracking of progress. Varying costs depending on specific action items pursued.	Begin FY2021 Complete FY2024 FY2023	OP-19: +2.5 – +3.0	Reduces operations cost. Reduces waste to landfill toward 85% net zero waste goal. Packaging materials handled by vendors, rather than the University is not considered waste generated by ISU. Reduces waste generated and costs associated with the management of the omitted waste.

	reducing waste generation. • 1.2 Establish agreements with vendors to reduce/return packaging material including pallets and Styrofoam. • 1.3 Develop education and awareness programs to promote waste reduction, with focus on seeking academic collaboration opportunities through curriculum and service learning.			FY2024 FY2023		

B. Increase Waste Diversion

	Strategy	Capital Investment	Δ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	Achieve 85% net zero waste (85% waste diversion) • 1.1 Identify current waste diversion practices and	Staff time to collect and benchmark current practices and procedures and pursue further opportunities.	Varying added costs and cost reduction pending changes to existing diversion and trash processes. Any actions with significant potential costs will be proposed and	Begin FY2021 Complete FY2025 FY2023	OP-19: +2.5 – +3.0	Reduces landfilled materials. Supports statewide initiative and EPA recommendation of sustainable materials management.

	opportunities and update collective waste disposal processes via the EH&S Waste and Recycling Guidelines.		reviewed for appropriate separate approval.			
	• 1.2 Identify opportunities for improvement within current campus policies and processes through processes including: a comprehensive waste audit characterization study, building occupant surveys, reusable food packaging options and additional reuse/diversion opportunities for items not able to be diverted through ISU Surplus.			FY2023		
	• 1.3 Implement pilot programs in key buildings to determine waste diversion baselines and potential – including pre and post-surveys.			FY2023		
	• 1.4 Reduce plastic food packaging. 1.4a Convert 75% of current plastic			FY2025		

	packaging to compostable packaging. 1.4b Replace dispensed carbonated beverage cups and lids with compostable packaging options. • 1.5 Increasing composting options for students, faculty and staff. • 1.6 Develop education and awareness programs to promote waste diversion with focus on seeking academic collaboration opportunities through curriculum and service learning.			FY2023 FY2023		

IV. Water Use and Grounds Management Subcommittee Strategies

Primary Credits

- **OP-10 Biodiversity – 1-2 points available, ISU 2019 submission points: 0.00/1.00**
    - This credit recognizes institutions that have a biodiversity management strategy designed to identify vulnerable ecosystems and species on campus and prevent, manage, and/or remediate damage to natural habitats and sensitive areas. Institutions earn 2.0 points when (1) conducting one or both of the following: an assessment to identify endangered and vulnerable species (including migratory species) with habitats on institution-owned or -managed land; and/or an assessment to identify environmentally sensitive areas on institution-owned or -managed land and (2) owning or managing land that includes or is adjacent to any of the following: legally protected areas (e.g., IUCN Category I-VI), internationally recognized areas (e.g., World Heritage, Ramsar, Natura 2000), priority sites for biodiversity (e.g., Key Biodiversity Areas, Alliance for Zero Extinction sites) or regions of conservation importance (e.g., Endemic Bird Areas, Biodiversity Hotspots, High Biodiversity Wilderness Areas). Incremental points can be earned.

- **OP-22 Water Use – 4 points available, ISU 2019 submission points – .47/4.00**
    - Recognizes institutions that have reduced water use. This credit is weighted more heavily for institutions located in areas of water stress and scarcity and less heavily for institutions in areas with relative water abundance. Institutions (in areas of low and low to medium risk for water abundance) earn 1 1/3 points for reducing potable water consumption by 30 percent per weighted campus user compared to a baseline, 1 1/3 points for reducing potable water use by 30 percent per gross square foot/meter of floor space compared to a baseline and 1 1/3 points for reducing overall water use by 30 percent per acre/hectare of vegetative grounds compared to a baseline. Incremental points can be earned.

- **OP-23 Rainwater Management - 2 points available, ISU 2019 submission points – 2.00/2.00**
    - Recognizes institutions that implement policies and programs to reduce stormwater runoff and resultant water pollution, and treat rainwater as a resource rather than as a waste product. Institutions earn the maximum of 2 points available for this credit by having comprehensive rainwater management policies, plans or guidelines that incorporate green infrastructure, cover the entire campus, and mandate the use of LID practices for all new construction, major renovation, and development projects. Incremental points can be earned.

Secondary Credits

- **AC-8 Campus as a Living Laboratory – 4 points available, ISU 2019 submission points – 4.00/4.00**
    - Recognizes institutions that utilize their infrastructure and operations as living environments for multidisciplinary learning and applied research that advances sustainability on campus. This credit includes substantive work by students and/or faculty (e.g., class projects, thesis projects, term papers, published papers) that involves active and experiential learning. Institutions earn 0.4 points for each area covered, regardless of how many projects there are in each area, up to 4 points.

The following targeted water use and grounds management goals align directly with the above noted STARS credits and are closely interrelated. Improvements to impact one credit have the potential to also impact others as can be noted in each of the corresponding strategies tables for each goal

A. Explore Additional Opportunities for Biodiversity Management

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	Develop campus-wide Biodiversity Inventory, Assessment and Management Plan. • 1.1 Complete Biodiversity Inventory of off-campus locations. 1.1a Complete Biodiversity Inventory of Story County to identify environmentally-sensitive areas or areas with endangered or vulnerable species that are adjacent to University owned or managed land. 1.1b Complete Biodiversity Inventory of ISU outdoor teaching laboratories to identify environmentally-sensitive areas or areas with endangered or vulnerable species that are adjacent to University owned or managed land.	Staff time to conduct assessment and develop management plan.	Staff time for annual review and monitoring and tracking of protocol practices and procedures.	Begin FY2022 Complete FY2023	OP-10: +1.0	Offers campus-wide consistent protocol for landscape development and management. Informs campus strategic planning, policy development and actions and decisions for landscape development and management. Engages students in campus operations sustainability projects and planning.

B. Reduce Water Consumption

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	• Establish University Water Conservation Plan encompassing all campus-wide stakeholders engaged in water management and conservation practices and protocol that includes drought conservation (in conjunction with and support of the City of Ames drought conservation plan).	Staff time to collect and benchmark current practices and procedures and combine into central document.	Staff time for annual review and monitoring and tracking of protocol practices and procedures.	Begin FY2022 Complete FY2025	OP-22: TBD Pending reduction goals	Offers campus-wide consistent protocol related to water-use consumption and management. Ensures opportunity for increased and enhanced water efficiencies and reduced operational costs for buildings and grounds. Engages students in campus operations sustainability projects and planning.
	• 1.1 Develop and implement improved water-efficient practices and setting water consumption reduction goals, utilizing “best of” strategies and opportunities across campus.			Complete FY2023		
	• 1.2 Develop and implement improved standards for water-efficient equipment use and procurement toward supporting water consumption reduction goals.			Complete FY2024		
	• 1.3 Produce an annual report benchmarking total annual campus			Complete FY2024		

	water consumption and monitoring specific water use metrics as well as tracking current water conservation practices and potential strategies for increased water conservation. • 1.4 Develop education and awareness programs to promote water conservation with focus on seeking academic collaboration opportunities through curriculum and service learning. 1.4a Create a campus water conservation website including the overarching campus water conservation plan, consumption dashboard metrics and highlighted projects, initiatives and strategies focused on water conservation. 1.4b Develop and implement talking points and a behavioral change initiatives and implementation plan related to reducing per capita water consumption.			Complete FY2025		

C. Diversify and Enhance Rainwater Management

	Strategy	Capital Investment	∆ Operating Costs	Target Year for Implementation	Predicted STARS Credit Score Impact	Potential Operational Impact / Item Justification
1	Develop storm water management plan for campus-wide development. • 1.1 Update Facilities Design Manual to reflect and prioritize opportunities in storm water management design standard efficiency, including opportunities for the reuse of rainwater in existing facilities and for irrigation.	Staff time to collect and benchmark current practices and procedures and combine into central document.	Staff time for annual review and monitoring and tracking of protocol practices and procedures.	Begin FY2022 Complete FY2024	OP-22: TBD Pending reuse opportunities and priorities	Offers campus-wide consistent protocol related to rainwater management. Ensures opportunity for increased and enhanced water efficiencies and reuse and reduced operational costs for buildings and grounds.
2	Research funding models for rainwater reuse. • 2.1 Identify funding models for storm water best management practices.	Staff time to research and identify funding opportunities and models.	None	FY2024	OP-22: TBD Pending reuse opportunities and priorities	Supports and sustains strategies identified in IV.C.1.