

Sustainability Council Fall 2022

December 13, 2022

iSEE

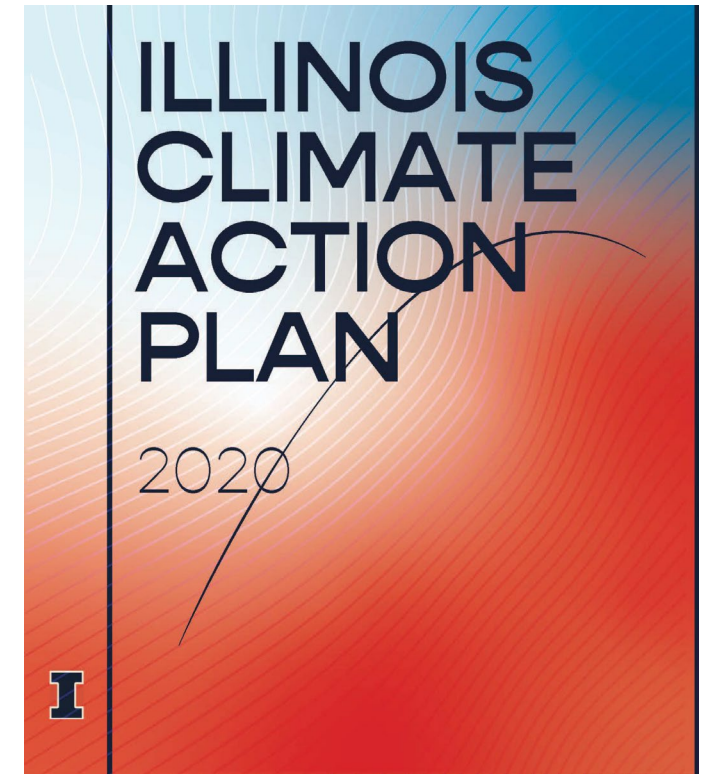
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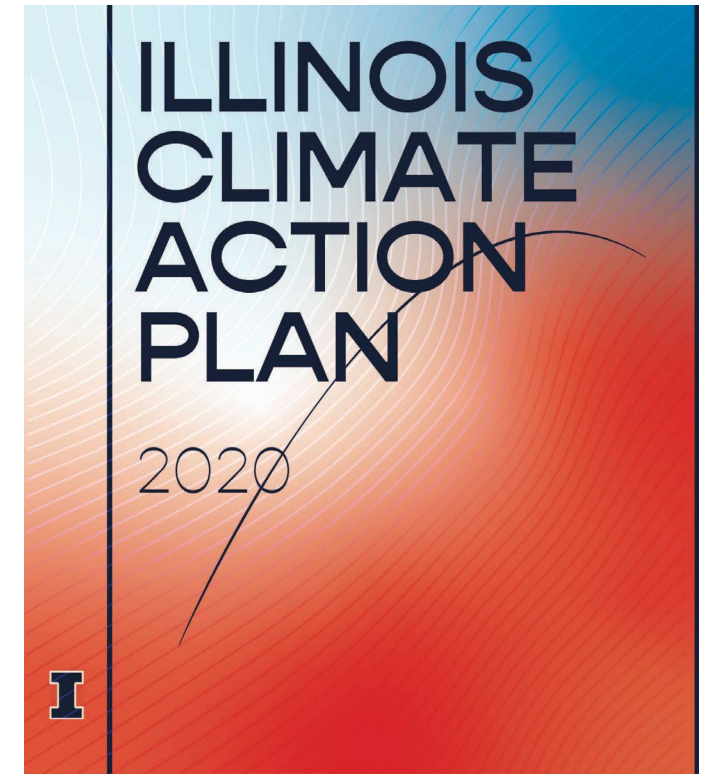
Members of Council

- **Chair:** Robert J. Jones, Chancellor, University of Illinois at Urbana-Champaign
- **Vice Chair:** Madhu Khanna, Director of iSEE
- William Bernhard, Interim Vice Chancellor for Academic Affairs and Provost
- Barry Benson, Vice Chancellor for Advancement; Illinois Foundation Senior Vice President
- Danita Brown Young, Vice Chancellor for Student Affairs
- Susan Martinis, Vice Chancellor for Research and Innovation
- Paul Redman, Associate Provost for Capital Planning
- Mike DeLorenzo, Vice Chancellor for Administration and Operations
- Iowa Mwilambwe, Associate Vice Chancellor for Auxiliary, Health & Well-Being



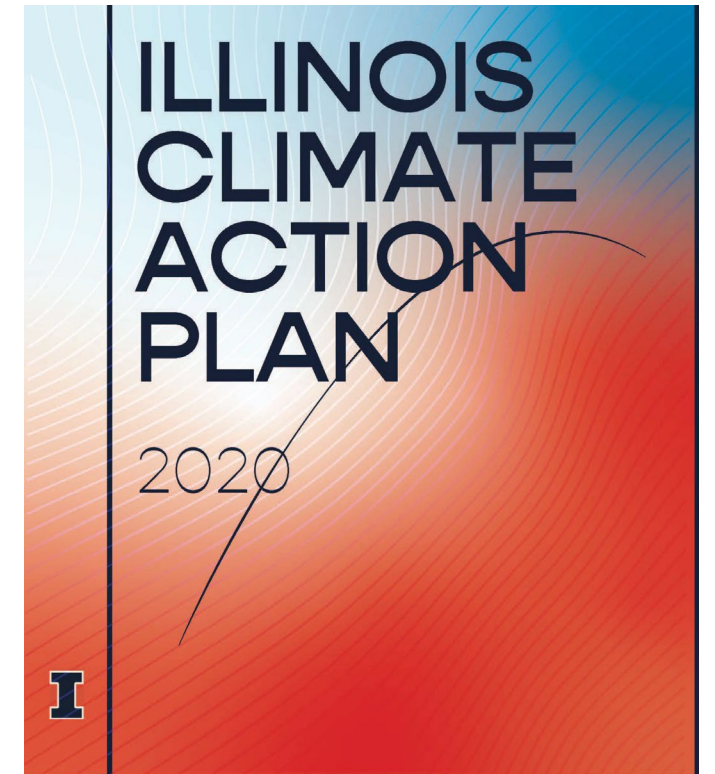
Members of Council

- Rashid Bashir, Dean, College of Engineering
- German Bollero, Interim Dean, College of Agricultural, Consumer, and Environmental Sciences
- Chrystalla Mouza, Dean, College of Education
- Venetria Patton, Dean, College of Liberal Arts & Sciences
- Ehab Kamarah, Associate Vice Chancellor and Executive Director, Facilities & Services
- Jeff Jenkins, Chair, Senate Executive Committee
- Garrett Forrest, President, Illinois Student Government (ISG)
- Jack Reicherts, Chair, Student Sustainability Committee (SSC)
- Owen Jennings, Co-Chair, Student Sustainability Leadership Council (SSLC)



Non-voting members and invited guests

- Luis Rodriguez, iSEE Associate Director for Education and Outreach
- Jeremy Guest, iSEE Associate Director for Research
- Eric Green, iSEE Senior Academic Advisor & Instructor
- Elizabeth Murphy, iSEE Managing Director
- Jennifer Fraterrigo, iSEE Associate Director for Campus Sustainability
- Morgan White, Facilities & Services Associate Director for Campus Sustainability
- Meredith Moore, iSEE Sustainability Programs Manager

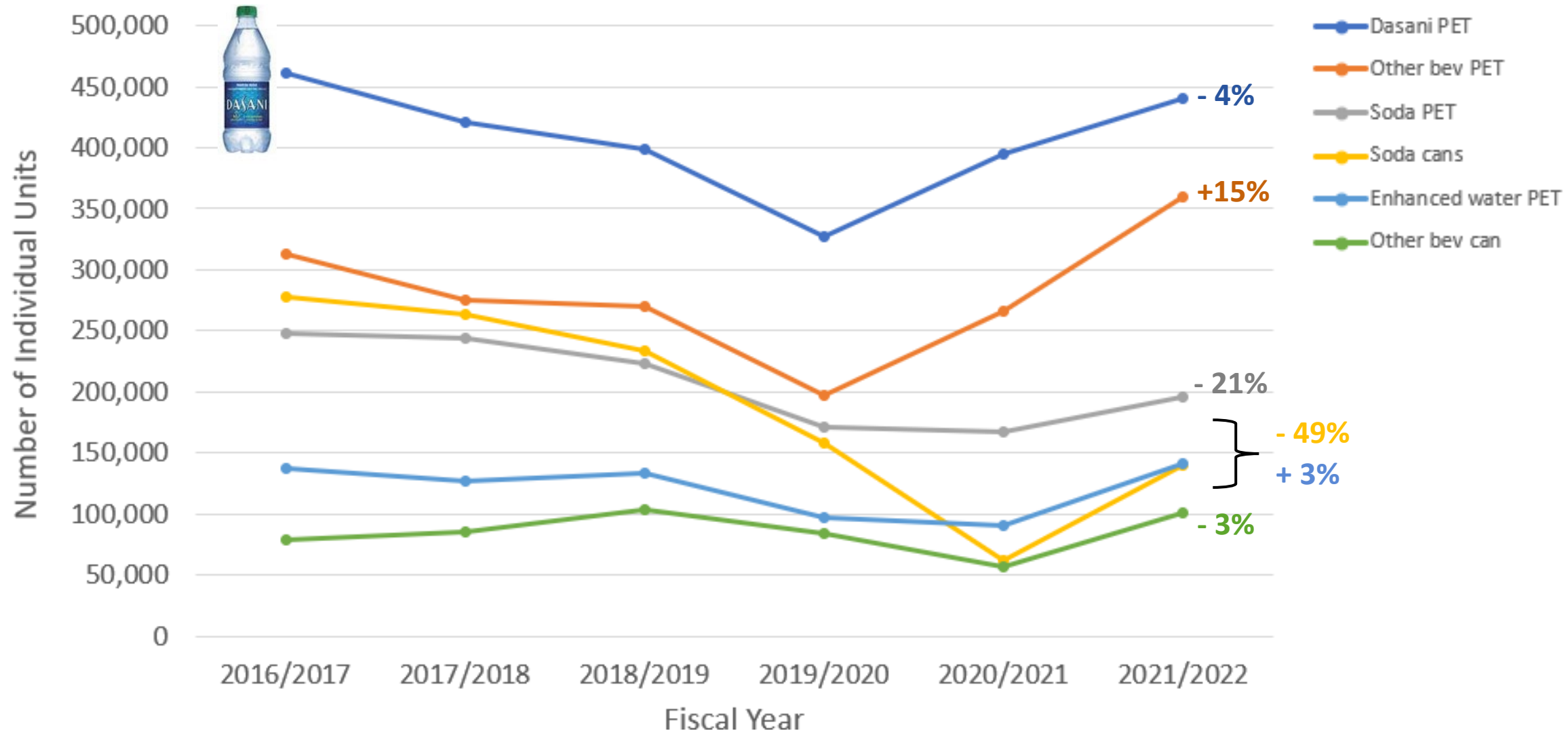


Agenda

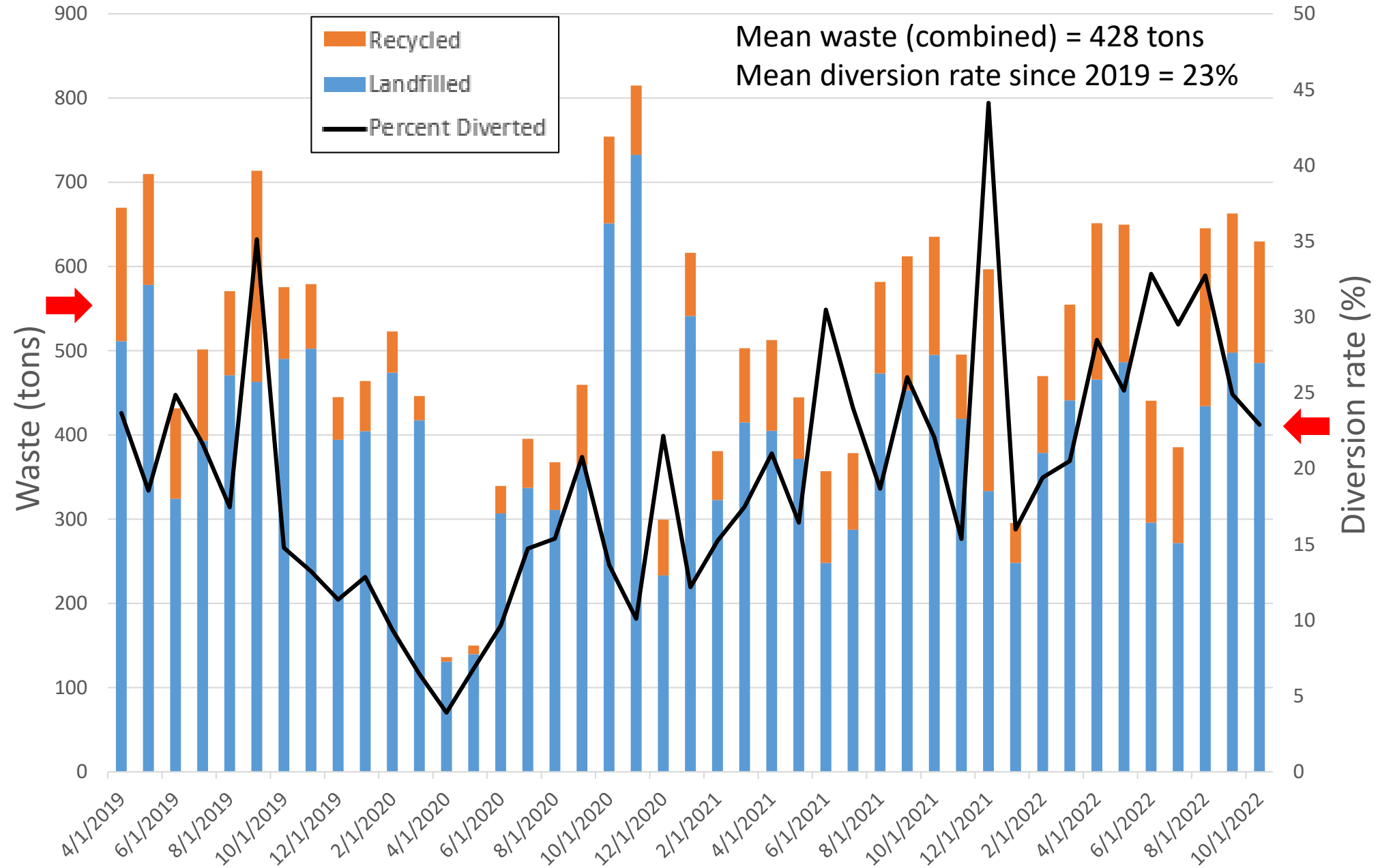
- Zero Waste
- Energy Planning
- Strategic Plan
- Old business
 - Sustainability General Education Requirement
 - Sustainable Land Management Committee Report



Plastic water bottles are a primary contributor to plastic waste



Only 20-30% of solid waste is recycled



Understanding the Single Use Plastic Waste Reduction Challenge for Campus

- Survey of students to understand drivers of demand for bottled water
- Mapping bottle filler stations to evaluate access to tap water
- Discussions with Coke
- Engagement with Athletics

Drivers of Demand

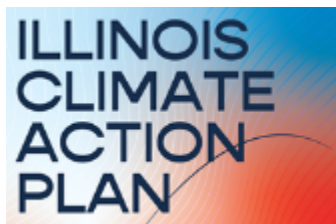
- **Drinking Water Survey (ZW005)**

- ~350 responses: convenience and flavor were primary factors for choosing bottled water
- Several participants noted that water bottle filler stations should be added outside of campus convenience stores



- **Water taste test**

- 75 participants in blind taste test at Green Quad Day: bottled vs. tap water
- Half of participants could not distinguish the difference between the two choices



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- Inventory of water bottle filler stations
 - Incomplete
 - Additional filling stations needed

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Discussions with Coca-Cola

- Discussed replacing plastic bottles with aluminum cans
 - Not a viable option
- Changed focus to increasing recycling rate
 - Infrastructure and engagement via “Don’t Waste” campaign
 - Messaging via digital platforms, large events, e.g., Welcome Celebration for ~6,000 incoming students
 - New portable bins



Partnering with Athletics

- Reach large audiences and divert plastic waste
 - Zero Waste Basketball Game, Nov. 14
 - Total waste collected = 2,620 lbs
 - Landfilled = 2,340 lbs, Recycled = 280 lbs
 - Diversion rate = 10.6%
 - Develop program for recycling in tailgating areas



Discussion: Next Steps

- Educational campaign about environmental problems caused by single-use plastics
- Infrastructure: Recycling bins and bottle filler stations
- Continued engagement with Athletics

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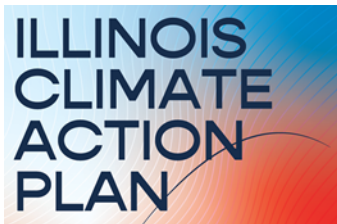


Comprehensive Energy Planning Document

- iCAP Working Group: We support hiring a professional service company to develop a specific, measurable, achievable, realistic, and time-bound carbon neutrality energy master plan.
- Sustainability Council: F&S and iSEE should work together to develop the scope for the study.

Progress

- ABE 469 senior capstone interviews for scope development
- Solar Farm 3.0 options analysis – in progress
- Energy Performance Contract for ACES Lab Facilities, preliminary technical audit starting
- Facility Condition Assessment; RFP closes 11/29/2022



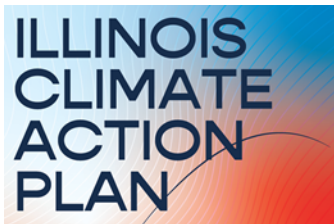
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Interviews included students, faculty, and staff

- 2/25/22: Bill Rose - *iCAP Energy Team Co-Chair*
- 2/25/22: Andrew Stumpf - *iCAP Energy Team Co-Chair*
- 3/8/22: Ximing Cai - *CEE Professor, Former Associate Director of iSEE*
- 3/11/22: Maria Maring - *SSLC iWG Representative*
- 3/11/22: Gabriel Kosmacher - *SSLC Member*
- 3/22/22: Rob Roman - *F&S Director of Utilities & Energy Services*
- 3/24/22: Scott Willenbrock - *Former Physics Professor, UIUC Solar Farm Involvement*
- 3/28/22: Cynthia Klein-Banai - *Director of Sustainability at UIC*
- 3/31/22: Caleb Brooks - *NPRE Professor, UIUC Micro-Nuclear Involvement*
- 4/5/22: Clark Bullard - *Former MechE Professor, Experience in Thermal Systems*
- 4/5/22: Xinlei Wang - *ABE Professor, Experience in Renewable Energy Systems*
- 4/5/22: John Zhao - *ABE Doctorate Student, Research in Geothermal Systems*
- 4/7/22: Mike Larson - *F&S Director of Utilities Production*
- 4/8/22: Paul Foote - *Energy Efficiency and Conservation Specialist*
- 4/8/22: Karl Helmink - *F&S Associate Director of Utilities and Energy Services*



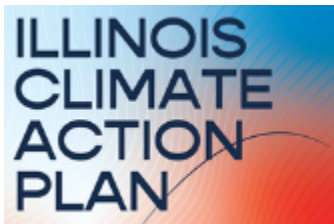
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Energy Plan Scope Topics from ABE

- Energy Efficiency: prevent additional energy loads, new buildings need to follow strict sustainability/energy efficiency standards, reduce/limit space demands
- Energy Conservation: expand existing conservation programs at F&S, and prioritize large mechanical renovations and building envelopes in deferred maintenance program, policies to encourage conservation
- Clean energy technologies: nuclear, solar, geothermal, air source heat pumps, solar thermal, renewable natural gas
- Conversion from steam to hot water heating system: electrification with a shift to using more clean power; need storage solutions



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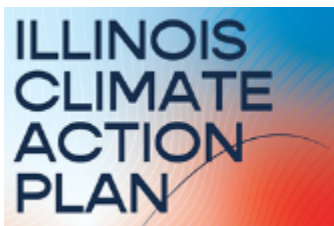
Discussions underway about Solar Farm 3.0



Solar Farm 1.0	+ ~5,000 MWh/yr
Solar Farm 2.0	+ ~20,000 MWh/yr
Wind PPA (Lincoln, IL)	+ ~25,000 MWh/yr
Solar Farm 3.0 (proposed)	+ 90,000 MWh/yr
iCAP goal	= 140,000 MWh/yr

Energy Performance Contract next project is starting soon

- Estimated Project Cost: \$40M
- Number of Buildings Proposed: 7
- Projected Annual Savings: \$1.5M in first year, 20 year payback
- Approximately 25% Cost Reduction
- These numbers are rough, preliminary estimates that would be finalized during the audit process when an ESCO is selected.
- Target Schedule: Energy Audit Agreement beginning in FY23



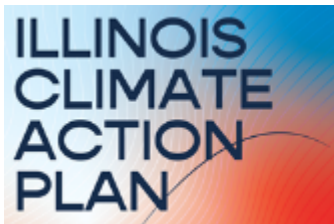
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Facility Condition Assessment

- Includes all three campuses, with 12.5M GSF included from UIUC in phase one
- Includes some auxiliary facilities from UIUC
- Schedule: RFP closes 11/29/2022, BOT contract approval in April 2023, UIUC phase one assessments to occur from summer 2023 to December 2024
- Key Deliverables:
 - Facility Condition Reports for each of the identified campus facilities
 - Editable database software that each university can access, maintain, update annually, customize and update prioritization, and use to produce building-specific, campus-specific reports, and system-level reports.



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Discussion: Options for Energy Reduction

- Increase funding for F&S energy conservation programs (retrocommissioning, occupancy sensors, energy performance contracts, etc.)
- Increase funding in campus Revolving Loan Fund, for internal campus loans to fund energy and water reduction projects
- Incentives/rewards for individual actions, like with Illini Lights Out, the Freezer Challenge, and the Energy Conservation Incentive Program (ECIP)
- Cost-share/match funding with Student Sustainability Committee projects that reduce campus energy use

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Strategic Plan

How can we incorporate sustainability and the iCAP 2020 into the Illinois Strategic Plan?



**Foster Scholarship,
Discovery, and
Innovation**



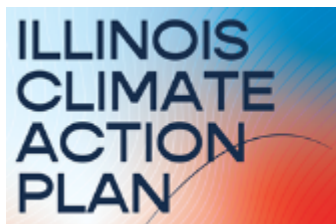
**Provide
Transformative
Learning Experiences**



**Make a Significant
and Visible Societal
Impact**



**Steward Current Resources
and Generate Additional
Resources for Strategic
Initiatives**



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Proposed Sustainability General Education Option

Luis Rodriguez

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Sustainability General Education Option

Review

Proposal: Create a 3 credit-hour gen-ed category within Natural Sciences and Technology for a course in sustainability and environmental topics

- Will be an option for all undergraduate students to fulfill their Natural Science and Technology credit hours
- Initially passed as an Illinois Student Government resolution
- iSEE has been supporting student efforts to get this approved



Sustainability General Education Option

Update

A proposal was submitted for review to the college Associate Deans for Academic Programs. The below feedback was given and will be incorporated into an updated proposal:

- This option should not be limited to the Natural Sciences and Technology category and should be expanded to have an option within Social and Behavioral Sciences category.
- There is a small number of courses that would be added to the Gen. Ed. list. This may not be an issue since this is only an option and not a separate requirement.
- Contact departments where courses were identified and determine if there is support from the unit's head to include those courses as fulfilling the general education requirement.
- Identify if there are expected shifts between which classes are taken and how that may impact colleges.



Sustainability General Education Option

Next Steps

- Revise proposal to incorporate Deans' feedback
- Reach out to department heads
- Resubmit proposal to college Deans
- Pass proposal through UC Senate committees
 - Educational Policy
 - Campus Operations
 - Senate Executive Committee
- Invite supporters and contributors to speak on behalf of proposal during discussion
- Introduce final proposal to Senate floor
- Gen-Ed Board will approve courses to fulfill the requirement



Sustainable Land Management Committee report

Adam Davis

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Charge to SLM Committee

- A. Sustainable land management practices: develop plan for evaluating and inventorying sustainable land management practices on the South Farms on non-research land, and for increasing the sustainability of South Farms land management practices.
- B. Agronomy Handbook: develop plan for updating the UIUC Agronomy Handbook with best management practices for sustainable land management.
- C. Outreach with university tenants: Work with interested tenants on University-owned land to showcase selected sustainable land management practices in the updated Agronomy Handbook.

Progress to date

- A. Inventory of sustainable practices on South Farms
 - 1. Cover crops, perennials and woody plants
 - 2. Dr. Emily Heaton's lab group: aggregating and analyzing management and soil data for past decade to get baseline data
- B. Updates to land management practices on South Farms
 - 1. Increased crop diversity on 'fill' acres (small grains and cover crops)
 - 2. Increased use of cover crops in experimental plots
- C. Agronomy Handbook chapter on sustainable farming practices
 - 1. Dr. Giovanni Preza-Fontes, Asst. Professor of Field Crop Extension Agronomy, potentially interested in having his group work on this. Will need postdoc support.

Thank you



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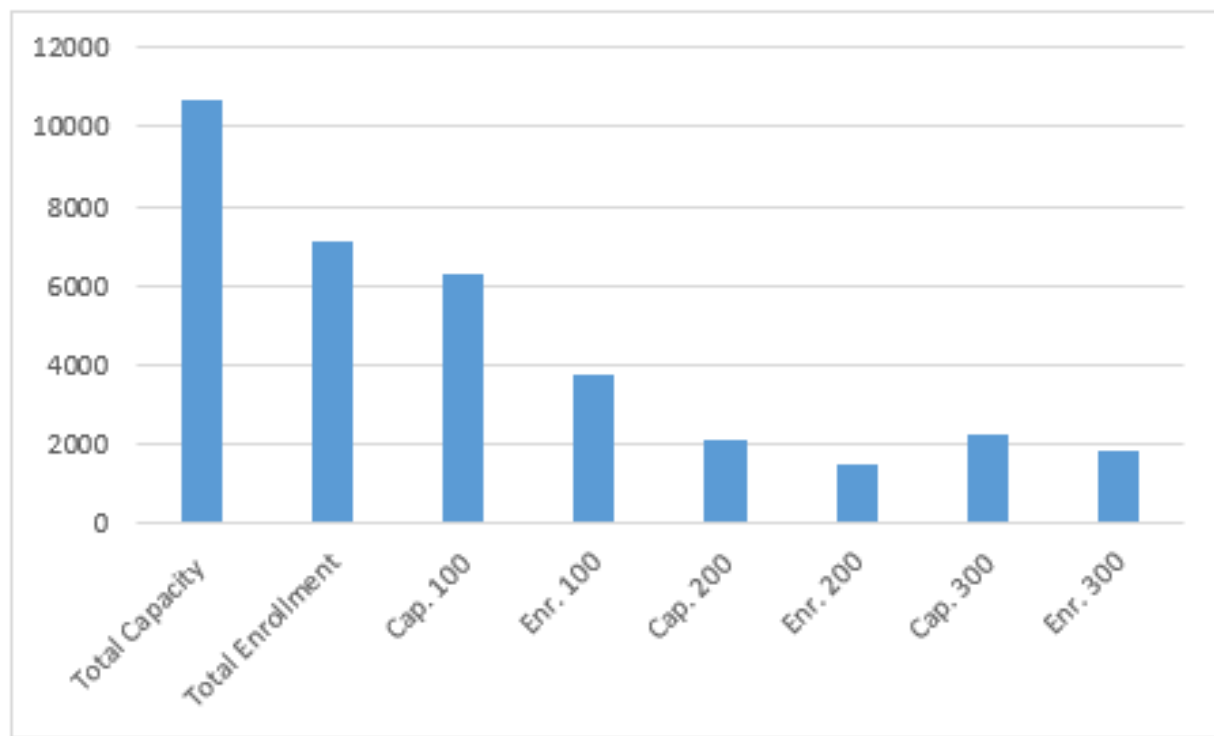


Figure 1: NST Candidate Course Capacity

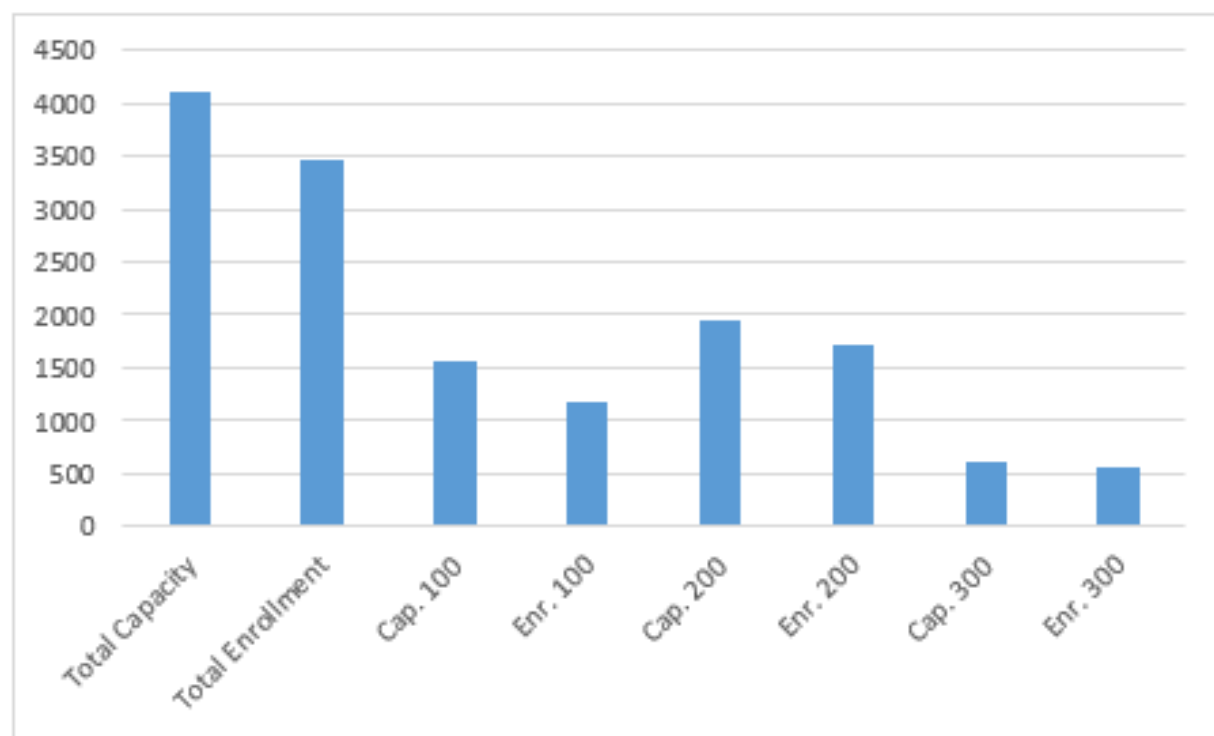


Figure 2: SBS Candidate Course Capacity

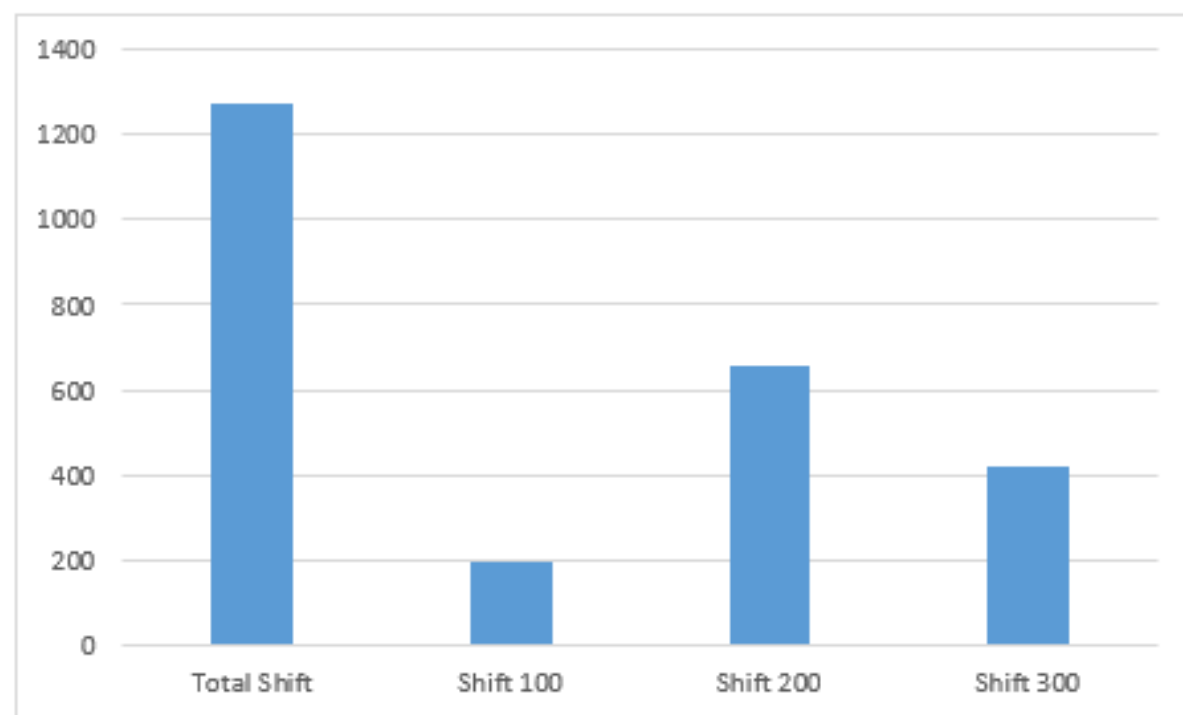


Figure 3: NST Shift in Demand

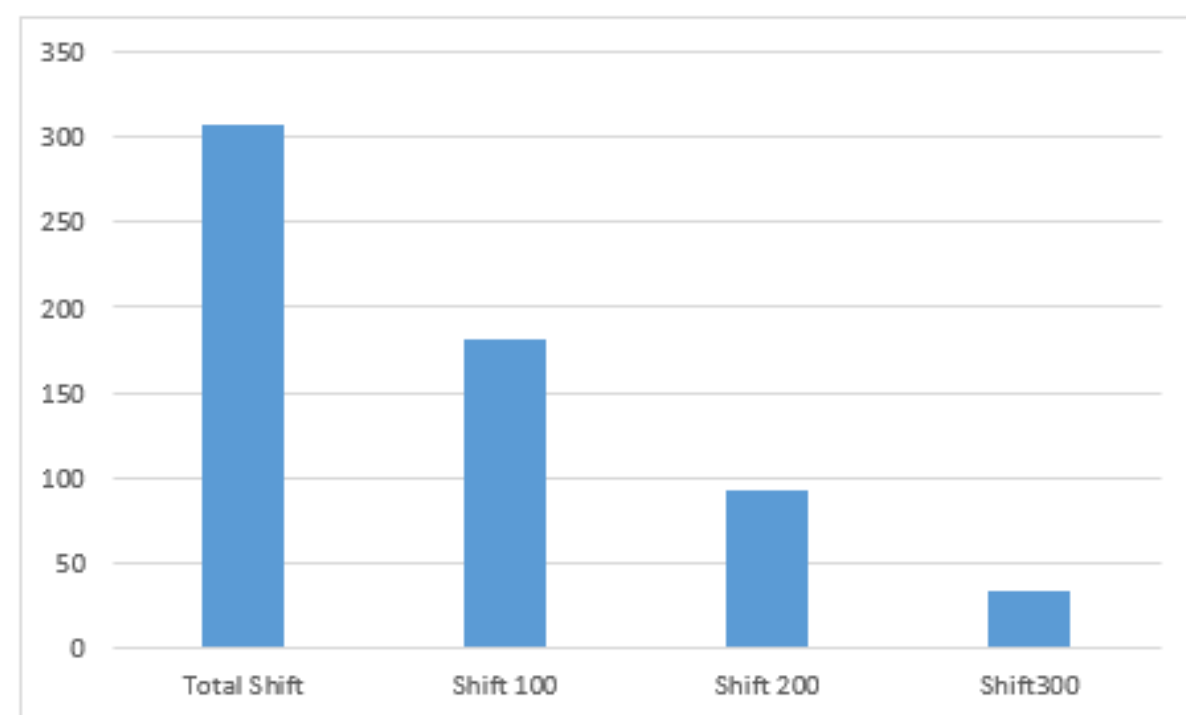


Figure 4: SBS Shift in Demand