Sustainability Council, Fall 2025

Madhu Khanna

Alvin H. Baum Family Fund Chair & Director

iSEE

Institute for Sustainability, Energy, and Environment

Council Membership

Members of Council

- **Chair:** Charles L. Isbell, Jr, University of Illinois Urbana-Champaign
- **Vice Chair:** Madhu Khanna, Director of iSEE
- Rashid Bashir, Dean, Grainger College of Engineering
- Dale Wright, Interim Vice Chancellor for Advancement Designate
- Germán Bollero, Dean, College of Agricultural, Consumer, and Environmental Sciences
- Danita Brown Young, Vice Chancellor for Student Affairs
- Brian Bundren, Assistant Provost for Capital Planning
- John Coleman, Executive Vice Chancellor for Academic Affairs & Provost
- Aimee Heeter, Senior Vice Chancellor for Finance and Administration

Members of Council, cont'd

- Angela Lyons, Senate Chair
- Ellen Cha, Chair, Student Sustainability Committee (SSC)
- Gabi DalSanto, President, Illinois Student Council (ISC)
- Natalie Reed, Co-President Student Sustainability Leadership Council (SSLC)
- Susan Martinis, Vice Chancellor for Research & Innovation
- Lowa Mwilambwe, Interim Vice Chancellor for Administration and Operations
- Venetria Patton, Dean, College of Liberal Arts & Sciences
- Emily Knox, Interim Dean, School of Information Sciences
- Josh Whitman, Director of Athletics (Tim Knox, delegate)

Non-Voting Members

- Jennifer Fraterrigo, Associate Director for Campus Sustainability iSEE, iWG Co-Chair
- Elizabeth Murphy, Managing Director, iSEE
- Morgan White, F&S Director of Strategic Initiatives & Sustainability, iWG Co-Chair
- Miriam Keep, Sustainability Programs Coordinator, iSEE

iSEE Institute for Sustainability, Energy, and Environment

Agenda for Today

1. Overview of Campus sustainability efforts
    a. Process
    b. Campus ecosystem of partners
    c. Progress to date
2. Illinois Climate Action Plan 2026
    a. High level overview of goals
3. Perspectives on campus sustainability from Gies, Grainger, ACES, DIA
4. Deferred maintenance burden and energy management- F&S
5. Discussion

Overview of Campus Sustainability Efforts

Commitment to Sustainability at Illinois

State of Illinois climate priorities

Commitment to 100% carbon-free power by 2045 (Climate & Equitable Jobs Act, 2021)

State of IL Priority Climate Action Plan (2024) outlines paths toward emissions reductions and support for energy efficiency, vehicle electrification, etc.

- IL EPA received $430M from US EPA to support priority reduction measures

University of Illinois System Guiding Principles

Financial and environmental sustainability is one of the five guiding principles

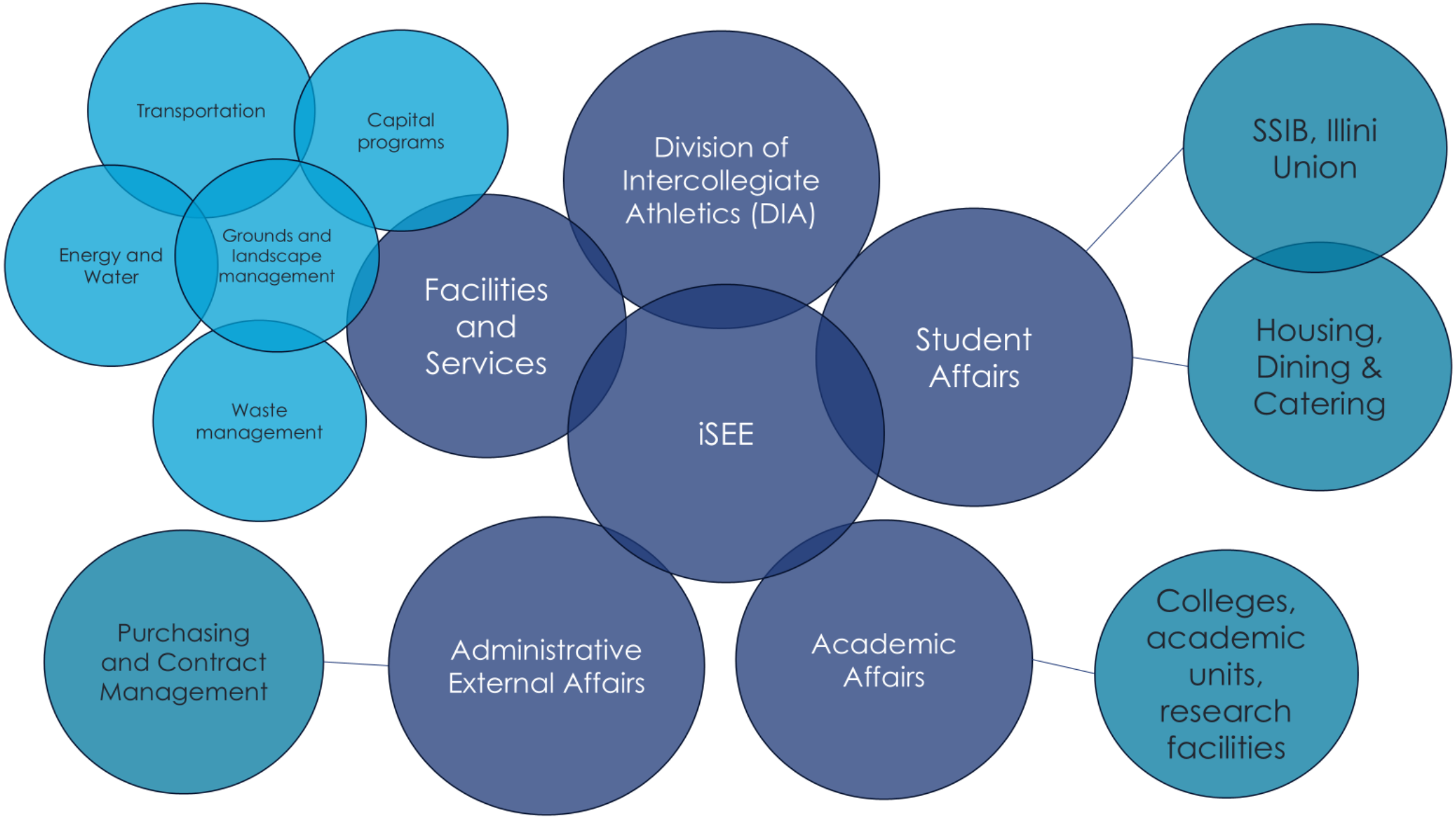
Climate Leadership Commitments at the U. of I.

- Signed by 500+ leading American higher education presidents and chancellors
- 2008: Chancellor signed the Carbon Commitment, pledging to be carbon neutral as soon as possible and no later than 2050
- 2016: Chancellor signed the Resilience Commitment, pledging to build resilience to climate change on our campus and with our local community

Campus Sustainability Goals

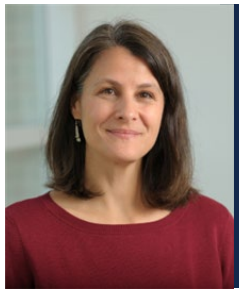
- Reduce **energy use** through conservation and efficiency and transition to clean energy sources.
- Enhance **sustainable transportation** options and transform the campus fleet to be less reliant on fossil fuels.
- Design and maintain **landscapes** that promote biodiversity, ecosystem health and integrity, and resilience of the natural system.
- Become a **zero-waste** campus by reducing sources of waste, maximizing diversion, and promoting a zero-waste culture.
- Enhance the environmental **sustainability of buildings** by reducing their energy, water, and carbon footprints.
- Amplify **sustainability education** through curriculum innovations.
- Foster a **culture of sustainability** on campus and encourage meaningful participation in climate action.

Units and student groups working on Campus Sustainability



iSEE's Role in Campus Sustainability

- Develop and update the iCAP, in collaboration with F&S and other campus units
- Track progress on iCAP goals and report on the university's sustainability performance
- Work with campus stakeholders to support activities in line with iCAP goals
- Engage with campus leadership to advocate for sustainability priorities and support for iCAP implementation
- Educate and build awareness on energy use, plastic and food waste, water conservation, sustainable land management, etc.
- Integrate campus sustainability into the university's educational and research mission



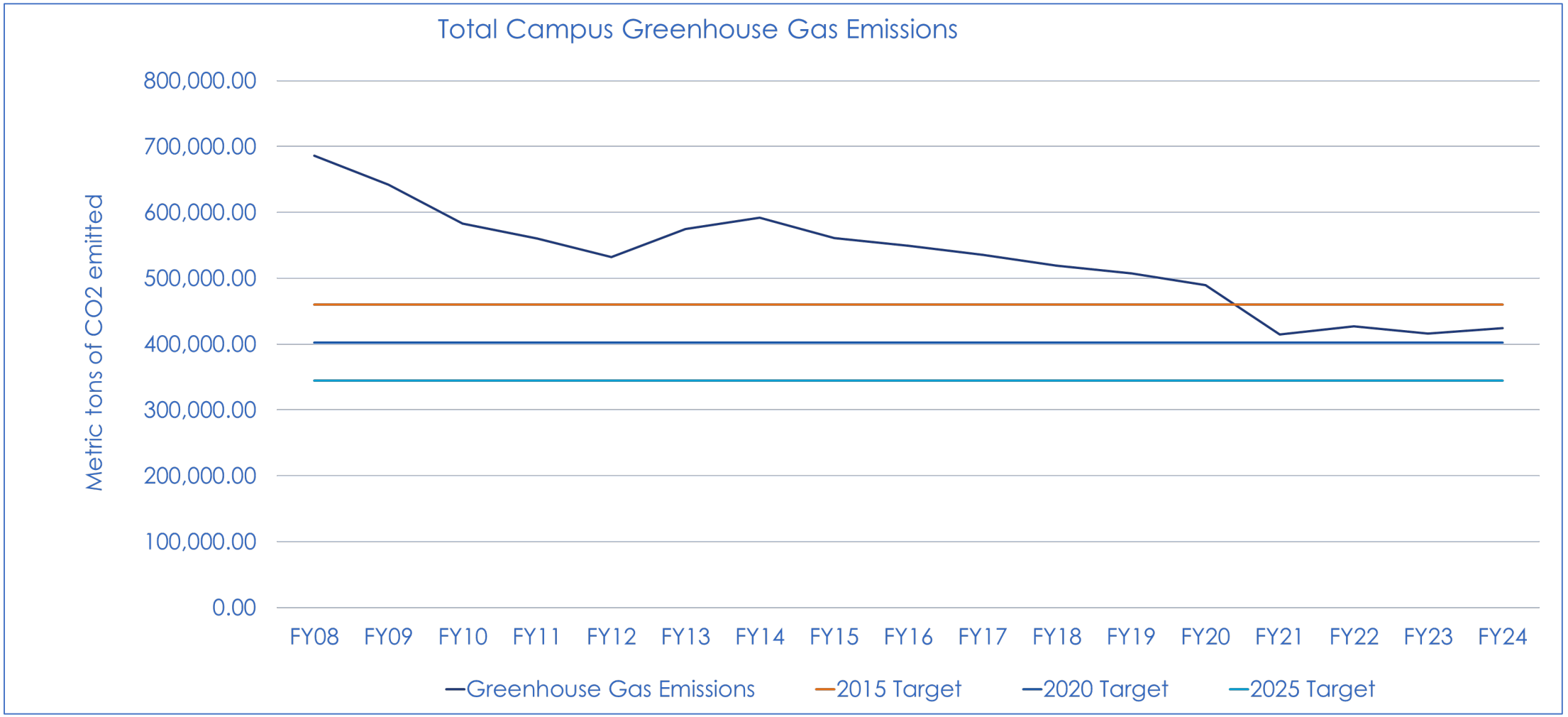
Associate Director

JENNIFER FRATERRIGO

Professor of Natural Resources and Environmental Sciences

Campus Sustainability

Progress to Date



Emissions have decreased by almost 40% since 2008.

iSEE

Energy Efficiency

Retrocommissioning

- 27% average energy use reduction per building
- $118M+ cost avoidance across over 90 campus buildings

Recommissioning

- Last year, 5 recommissioned buildings saved average of 32% in energy consumption

Energy Performance Contracts

- Over $109M invested in EPCs since 2008
- $67M of deferred maintenance addressed since 2008
- Over 24k metric tons of carbon emissions avoided annually
- Over $212M in guaranteed energy savings over 20 years

Renewable Energy

Solar Power

- Two on-campus solar farms produce approx. 27,000 megawatt hours/year
- Multiple rooftop installations

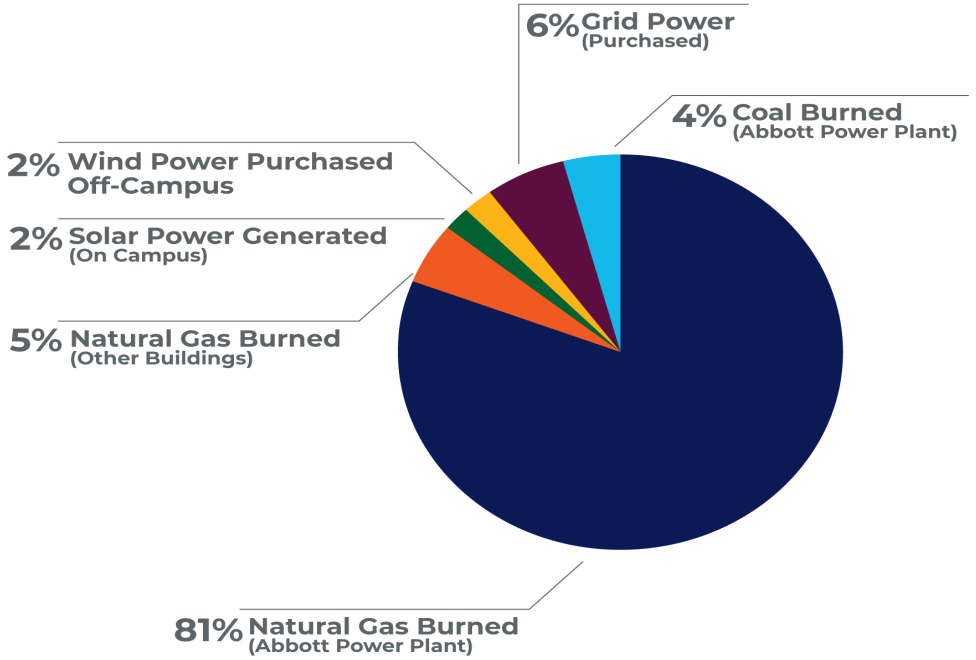
Wind Power Purchase Agreement

- University buys over 25,000 megawatt hours per year of wind-generated electricity

Geothermal Energy

- Seven geothermal exchange projects have been installed on campus since 2010, providing approximately 44,800 MMBTU of geothermal energy per year

FY24 Energy Sources in MegaWatt (Hours/Year)



Other Sustainability Initiatives

Sustainable transportation

- Investments in bicycle infrastructure
- Complete streets
- EV infrastructure
- Green fleets

Land & Water

- Tree planting and maintenance
- Pollinator-friendly plantings
- Green infrastructure

Zero Waste

- Grind2Energy
- Recycling infrastructure
- Policy and behavior change

Education & Engagement

- Expanding sustainability educational offerings
- Opportunities for campus community involvement

Integrating Research and Campus Sustainability

Campus as a living lab

- Testbed for faculty researchers developing prototypes and conducting field experiments related to sustainability

Research examples

- Agrivoltaics: Colocating agriculture and solar energy on the same land
- iSEE, F&S, PRI, and Extension are founding members of Illinois Geothermal Coalition
- Alternative models for EV charging
- Proposed construction of a nuclear microreactor by NPRE
- Behavioral research to understand demand for single use plastics

Green Research

- U. of I. has been honored eight times in the International Freezer Challenge, which promotes energy efficiency in lab cold storage equipment

Sustainability Awards and Recognition

EPA GREEN POWER PARTNER

SUSTAINABILITY TRACKING, ASSESSMENT & RATING SYSTEM
stars
a program of aashe
GOLD

BICYCLE FRIENDLY UNIVERSITY
2023-2027
SILVER
THE LEAGUE OF AMERICAN BICYCLISTS

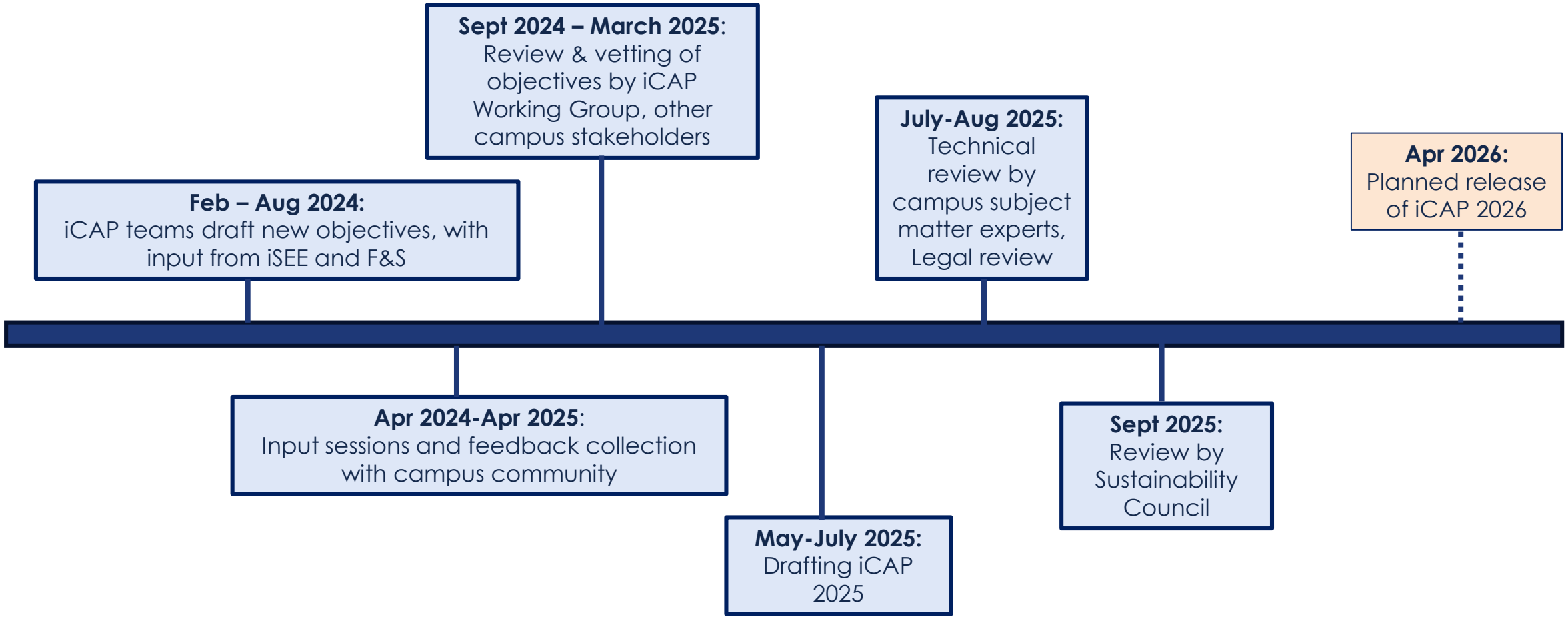
Making The World Safer For Pollinators
Bee Campus USA
One Campus At A Time

TREE CAMPUS
HIGHER EDUCATION
An Arbor Day Foundation Program

U.S. GREEN BUILDING COUNCIL
LEED CERTIFIED
USGBC

iCAP 2026

iCAP 2026 Development Timeline



Ongoing Energy Conservation and Efficiency

Energy Use Per Square Foot:

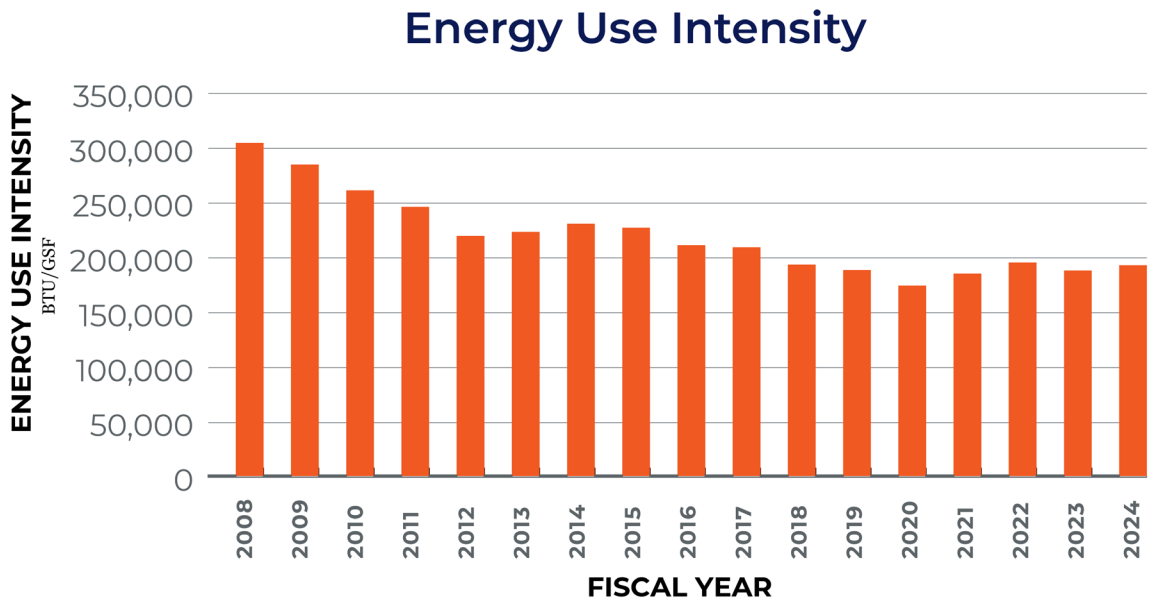
- 36% reduction compared to FY08 baseline
- Progress has plateaued since FY20

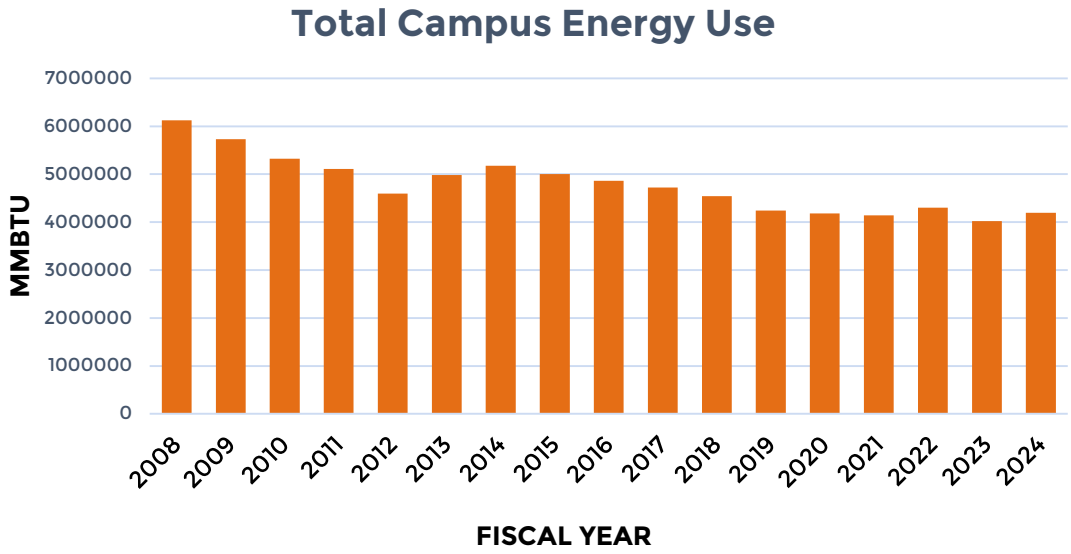
Contributing factors

- Increase in energy-demanding space and deferred maintenance
- Few sustainable design features
- Low-cost changes have already been made

Total Energy Use:

- 31% reduction compared to FY08 baseline

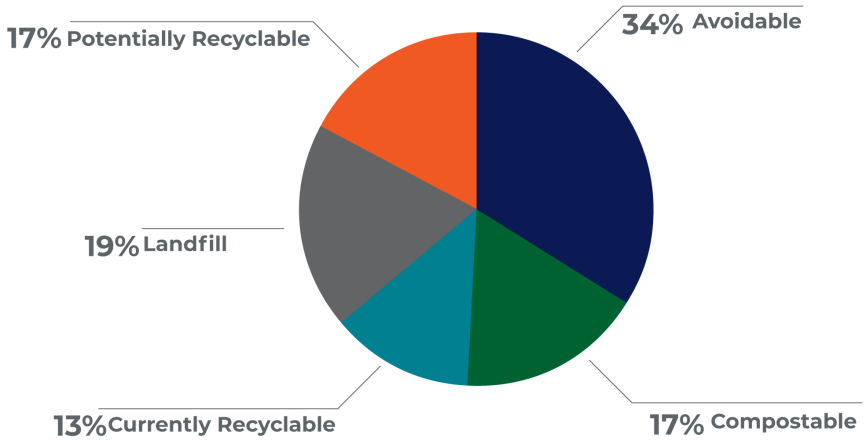




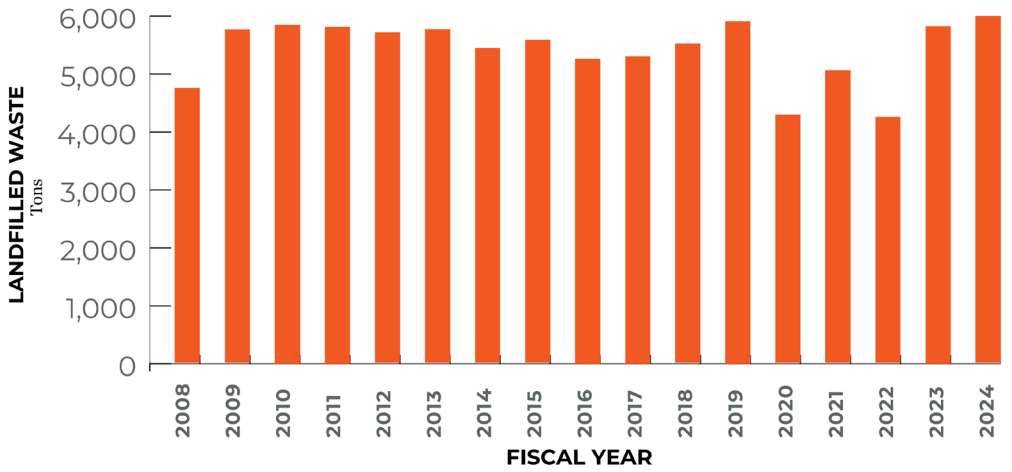
Ongoing Waste Reduction Efforts

- Despite efforts, we have not seen major declines in annual landfilled waste
- Opportunities exist to reduce landfilled waste

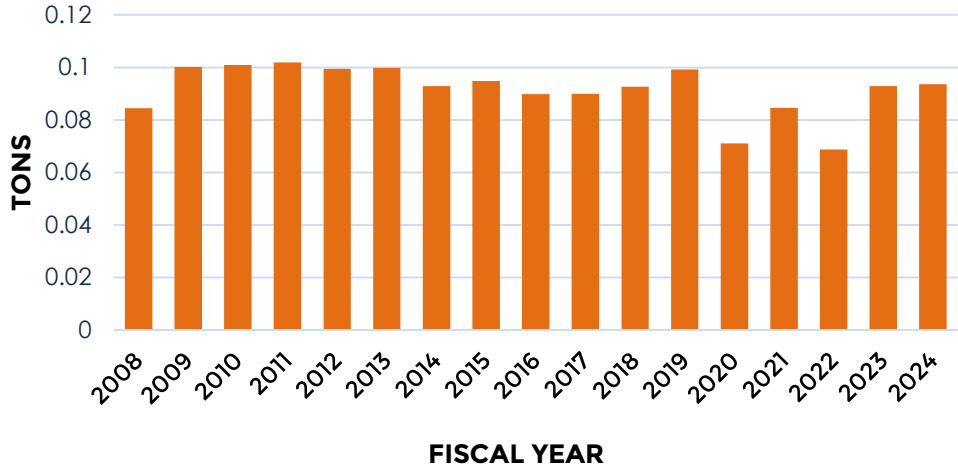
Composition of Landfill Waste from Audited Buildings



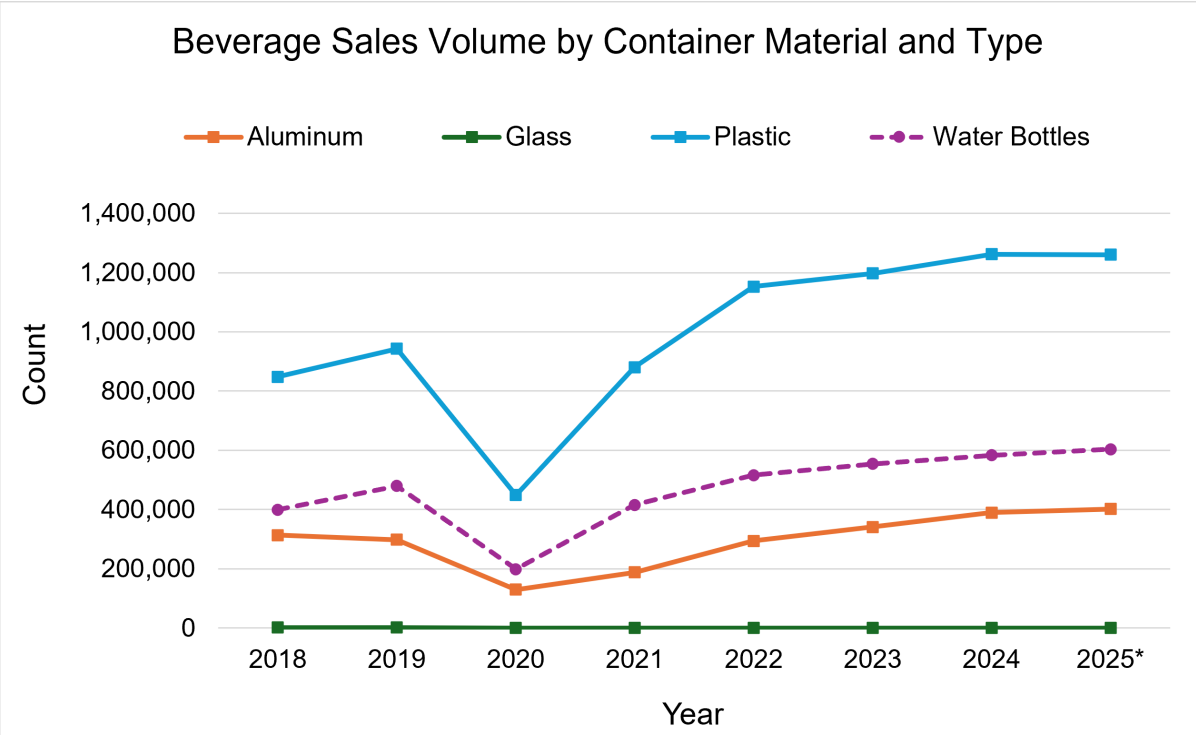
Landfilled Campus Waste

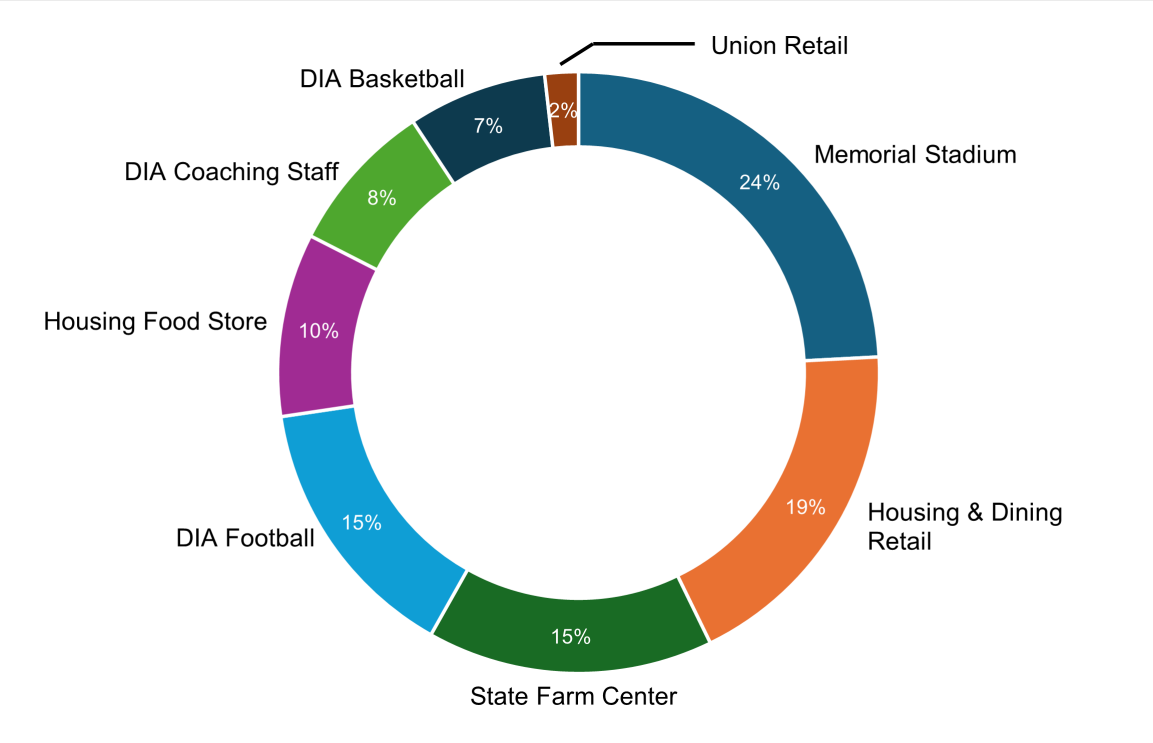


Landfilled Campus Waste Per Capita



Plastic bottle sales remain high; bottled water accounts for ca. 50%



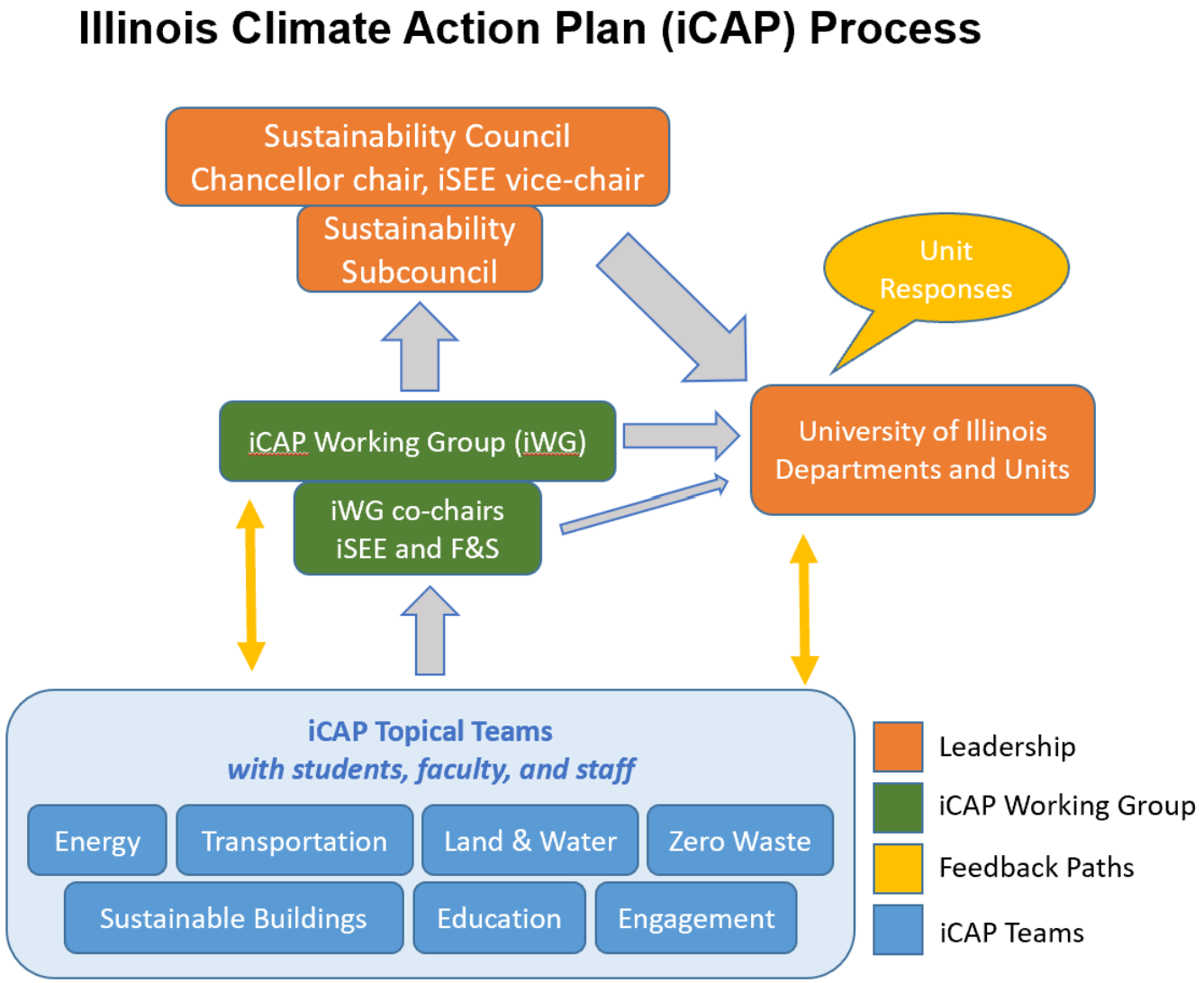


2025* = Jan-Nov

Campus Sustainability

Illinois Climate Action Plan

- Strategic plan for achieving carbon neutrality before 2050
- Teams for seven major iCAP themes with faculty, researchers, students, and staff members, and a paid student clerk (7-10 active members).
- Strong partnerships with F&S; support from campus leaders
- Updates every five years to take stock of progress and update goals



iSEE

Key Focus Areas in iCAP 2026

- Develop tailored strategies and targets to reduce energy use in conjunction with colleges and DIA
- Transition the campus to more renewable energy and an electric vehicle fleet
- Increase the abundance, diversity, and health of indigenous and pollinator-friendly plants
- Improve management of food waste and recyclable waste through enhanced infrastructure and behavior change
- Assess the sustainability features of existing campus buildings and opportunities for sustainable design standards
- Incorporate sustainability content into existing courses
- Organize education and awareness campaigns to foster sustainable actions
- Incorporate considerations for resilience of campus infrastructure to the changing climate

Colleges Campus Sustainability efforts

Gies perspectives on campus sustainability

December 3, 2025

Gies College of Business

Our Purpose

*Gies Business shapes **purposeful leaders** through life-changing access to education, research and innovation.*

Gies Strategic Priorities

Gies College of Business

Campus footprint

Gies occupies four facilities

- Richard D. and Anne Marie Irwin Doctoral Study Hall (1904)
- Wohlers Hall (1964)
- Business Instructional Facility (2008)
- Steven S. Wymer Hall (2025)

Gies College of Business

Our Commitments

Fuel innovation *through a diverse, engaged community that's inspired to discover new ways to do business and new ways to teach business.*

Gies Strategic Priorities

Business Instructional Facility

- The Business Instructional Facility marked our first major sustainability milestone—it became the first LEED platinum building on campus and set the standard for every project that followed.

Gies College of Business

Steven S. Wymer Hall

- First to fully heat AND cool with geothermal
- Tracking towards LEED platinum and LEED zero energy (net zero) certifications
- Third net zero building on campus
- Student Sustainability Committee support
- Expandable geothermal field beneath Military Axis

Gies College of Business

Our Beliefs

“

Purposeful Innovation

We believe in celebrating curiosity, challenging assumptions, and pushing boundaries to lead and ***model what’s next.***

”

Gies Strategic Priorities

Gies Net Zero

- First net zero college on campus
- Gies Business net zero article link

Gies College of Business

Partnerships

STAKEHOLDERS

December 2023 – start of monthly discussions

- Gies leadership and Gies facilities
- F&S leadership
- F&S utilities
- Real Estate Services
- Development partner

MEMO OF UNDERSTANDING (MOU)

June 2024 - Gies Business and F&S sign MOU

- MOU positions Gies as first net zero college
- Allows Gies to purchase Renewable Energy Certificates (RECs) from solar farm 1 and/or 2 until solar farm 3 is operational, at which point RECs transition to solar farm 3
- Concurrently work to reduce carbon footprint and number of RECs

Costs

Ongoing work to reduce reliance on RECs

- Wohlers Hall
  - Re-commissioning HVAC (2024 - 2025)
  - Interiors upgrade, including lighting (2025 - 2026)
  - Replace exterior windows/doors (TBD)
  - Restroom upgrade (TBD)

Current cost of net zero in RECs

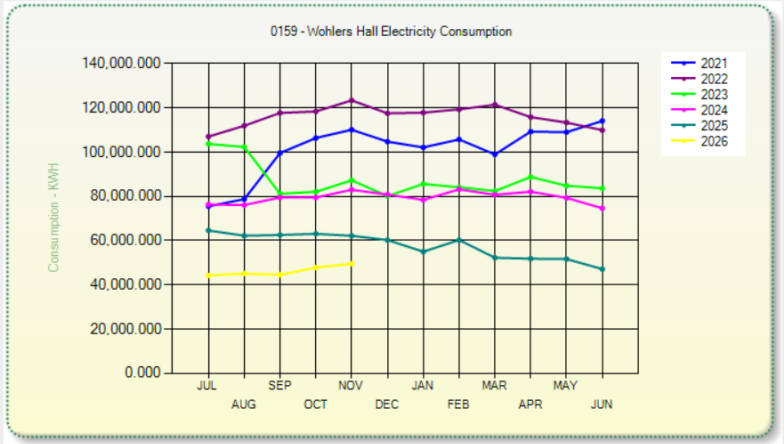
RECs	BUILDING
1,100 MWh/1,100 RECs	Wymer
5,300 MWh/5,300 RECs	BIF
5,000 MWh/5,000 RECs	Wohlers
525 MWh/525 RECs	Irwin
11,925 RECs	**TOTAL $1.50/year = $17,888/year**

Energy savings

Wohlers Hall Re-commissioning update November 2025

- On target to meet or exceed expected savings of 50% total energy reduction in the building

0159



0159 - Wohlers Hall Electricity

	FY 2021			FY 2022			FY 2023			FY 2024			FY 2025			FY 2026		
	Consumption (KWH)	Billing Days (Average)	Degree Days	Consumption (KWH)	Billing Days (Average)	Degree Days	Consumption (KWH)	Billing Days (Average)	Degree Days	Consumption (KWH)	Billing Days (Average)	Degree Days	Consumption (KWH)	Billing Days (Average)	Degree Days	Consumption (KWH)	Billing Days (Average)	Degree Days
JUL	75,514.000	29	379	107,015.000	29	288	103,697.000	31	356	76,283.000	29	334	64,592.000	29	283	44,264.000	29	435
AUG	78,731.000	30	256	111,911.000	30	339	102,323.000	28	286	76,105.000	30	281	62,218.000	30	283	45,127.000	30	292
SEP	99,614.000	30	151	117,718.000	30	220	81,212.000	31	219	79,465.000	30	148	62,565.000	32	176	44,567.000	30	223
OCT	106,371.000	29	419	118,358.000	29	280	82,063.000	29	365	79,485.000	29	338	63,078.000	27	238	47,815.000	29	273
NOV	110,106.000	30	571	123,380.000	96	758	87,241.000	30	678	82,996.000	30	657	62,198.000	30	553	49,561.000	30	0
DEC	104,728.000	29	977	117,528.000	30	786	80,129.000	30	1094	80,830.000	30	795	60,262.000	31	973	--	--	--
JAN	102,121.000	30	1107	117,826.000	33	1324	85,623.000	32	960	78,384.000	29	1217	55,003.000	31	1357	--	--	--
FEB	105,725.000	30	1228	119,297.000	28	1099	84,080.000	28	812	83,182.000	30	762	60,275.000	29	1000	--	--	--
MAR	98,969.000	27	600	121,419.870	27	701	82,419.000	27	771	80,732.000	28	575	52,266.000	27	565	--	--	--
APR	109,259.000	30	390	115,821.000	29	505	88,758.000	30	374	82,119.000	30	370	51,853.000	29	363	--	--	--
MAY	109,002.000	29	273	113,342.000	32	251	84,810.000	28	173	79,319.000	15	127	51,683.000	29	158	--	--	--
JUN	114,081.000	30	291	109,929.000	27	292	83,662.000	31	239	74,625.000	30	297	47,140.000	29	295	--	--	--
Overall	1,214,221.000	29	6,642	1,393,544.870	35	6,843	1,046,017.000	29	6,327	953,525.000	28	5,901	693,133.000	29	6,244	231,334.000	29	1,223

Gies College of Business

Challenges and Opportunities

COST

- Understand cost of net zero
  - Requires RECs analysis at the building level to achieve net zero
  - Market to and inform campus clients
  - Budget assistance and incentives

CHOICE

- Offer green energy as a choice
  - Create solar capacity charge modeled on chilled water capacity charge?
  - Alternatives like small scale nuclear, energy storage, derivatives use policy (DUP) updates
  - Market solar RECs and “anchor” opportunities for solar farm 3 to units with plan for backend support to quantify RECs, costs, re-commissioning and impact

Gies College of Business

Thank you.

THE GRAINGER COLLEGE OF ENGINEERING

ILLINOIS MICROREACTOR DEMONSTRATION PROJECT

University of Illinois is driving the clean, resilient energy revolution

GLOBAL IMPACT

The mission is to de-risk advanced reactor deployment and enable a new paradigm of nuclear power through education, research and at-scale demonstration.

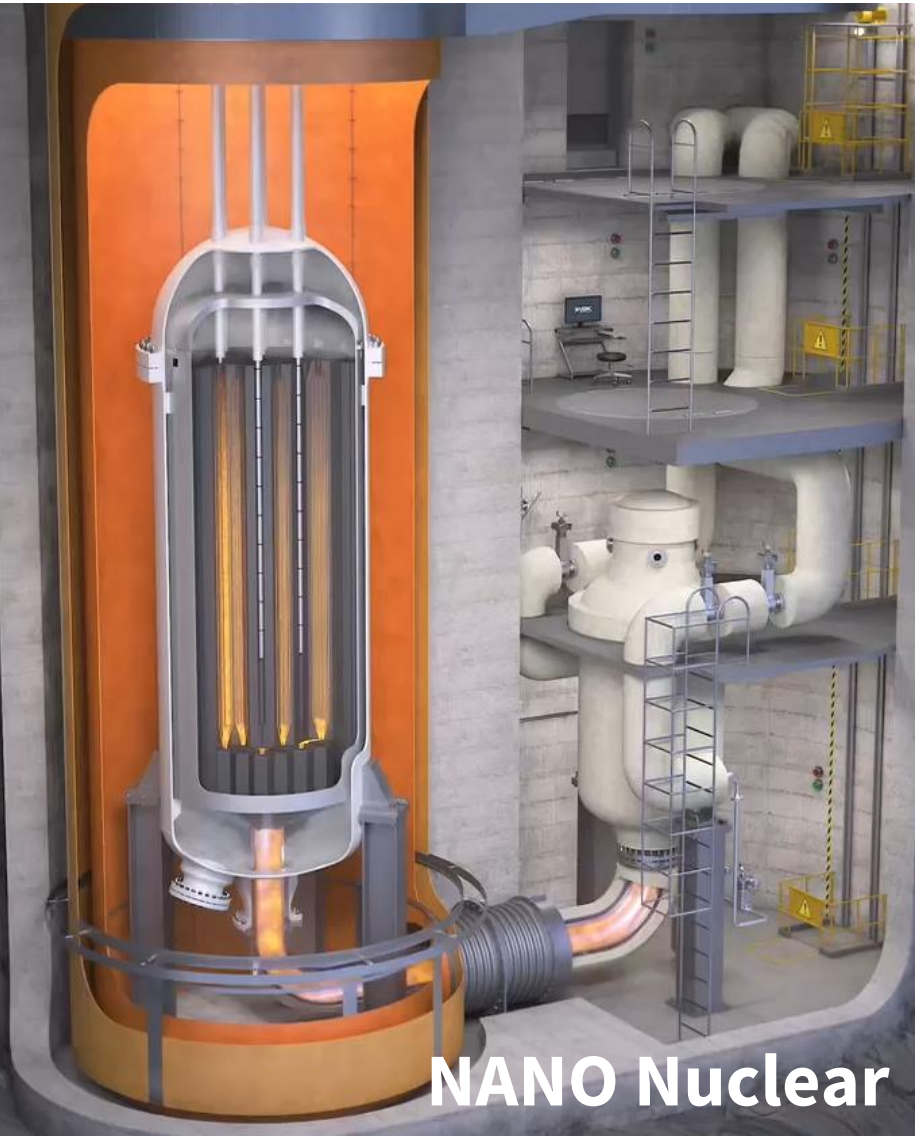
Large and accelerating demand for clean reliable energy

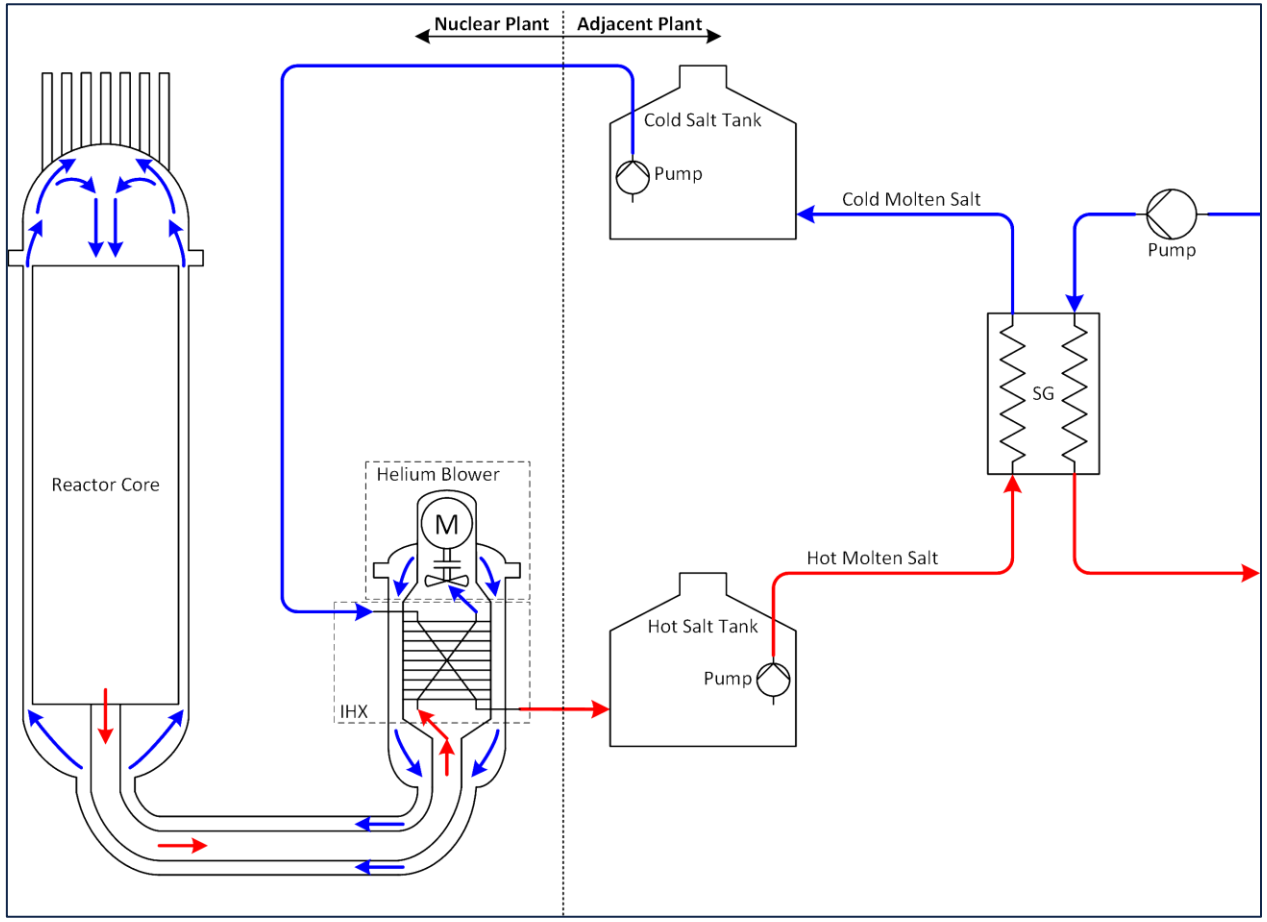
- Datacenters
- Clean process heat
- Remote communities
- Military and other critical installations

U. of I. is leading the country in the deployment & demonstration of new nuclear technology

- Repurpose existing fossil fuel installations
- Coupling to microgrids with integrated energy storage
- Technology optimization and innovation
- R&D needed to advance commercialization
- Workforce development for new nuclear industry

KRONOS MICRO-MODULAR REACTOR (MMR)





Primary Loop

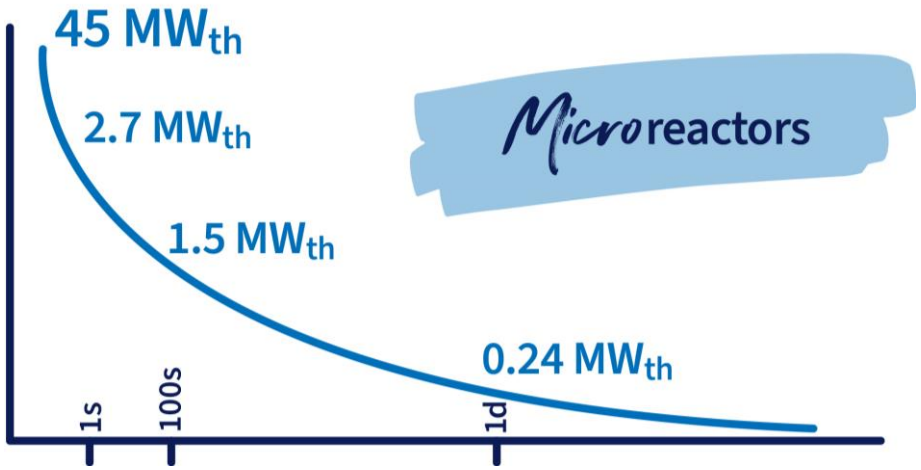
- 100s of degrees of margin between operating temps and safety limits
- Helium (6 MPa, 300°C - 660°C)

Intermediate Loop

- Decouple reactor operations from process heat dispatch
- Molten Salt (0.3 MPa, 275°C - 565°C)

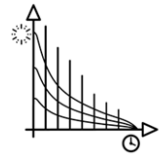
MICRO NUCLEAR REACTOR SAFETY

Safety in size: Conventional nuclear systems must be actively cooled after shutdown to remove residual power.



- Microreactors are so small, they cool naturally, with all heat dissipating into the surrounding structures.
- 67x lower power means 67x less residual power after shutdown.

Physics-limited core temperature



Passive decay heat removal

Extremely thermally robust fuel

Fission products retained in any accident scenario

Geo-tech Drilling and Ceremony

Joint U of I, NANO ceremony (Oct. 24th)

- Leaders from State and local community
- Strong press engagement with very positive response
- Leadership discussions and round table chat with NANO execs

Geo-tech Drilling (mid October – mid November)

- AECOM performed the site characterization
- Required to understand the seismic behaviour and constructability
- Very positive findings

October 7, 2025

Governor Pritzker Announces NANO Nuclear Energy to Establish Operations in Illinois

NANO Nuclear Energy to receive REV Illinois incentive award of $6.8M

New York, N.Y., Oct. 07, 2025 (GLOBE NEWSWIRE) — NANO Nuclear Energy Inc. (NASDAQ: NNE) ("NANO Nuclear" or "the Company"), a leading advanced nuclear energy and technology company focused on developing clean energy solutions, today announced that the Company, alongside Governor JB Pritzker and the Illinois Department of Commerce and Economic Opportunity (DCEO), will establish a manufacturing and research & development facility in Illinois.

NANO Nuclear plans to make an investment of more than $12 million with the support from the Reimagining Energy and Vehicles in Illinois (REV Illinois) program, which will enable the company to establish its operations and create 50 new full-time jobs. NANO Nuclear will receive $6.8 million in incentive awards from the REV Illinois program.

"I'm proud to welcome NANO Nuclear to Illinois' growing clean energy economy," **said Governor JB Pritzker.** "Our qualified workforce, unmatched infrastructure, and competitive incentives all make Illinois the best state for companies investing in clean energy production. With support from REV Illinois, this critical investment from NANO Nuclear will create new jobs for hardworking Illinoisans and promote innovative strides in clean energy solutions."

"With Illinois being the birthplace of the controlled nuclear chain reaction, and the state with the largest nuclear electricity production, it is really exciting to see NANO Nuclear being selected to advance and grow nuclear energy and expertise in the state," said **Dr. Florent Heidet, Chief Technology Officer of NANO Nuclear**. "With the strong presence of nuclear utilities and R&D institutions in Illinois, this is the ideal ecosystem for us to thrive."

NANO Nuclear recently acquired a property in the Chicagoland area featuring a 23,537-square-foot stand-alone facility, including a dedicated 7,400-square-foot non-nuclear demonstration area. The facility is expected to support nuclear engineers, component manufacturers, researchers, and support personnel who will work in collaboration with the University of Illinois Urbana-Champaign on NANO Nuclear's lead project, the KRONOS MMR™ Microreactor Energy System.

https://nanonuclearenergy.com/governor-pritzker-announces-nano-nuclear-energy-to-establish-operations-in-illinois/

Figure 1- Governor Pritzker Announces NANO Nuclear Energy to Establish Operations in Illinois.

"We're proud to support Illinois' efforts to drive innovation in the U.S. nuclear energy sector and to bring high-level engineering jobs to the state," **said James Walker, Chief Executive Officer of NANO Nuclear.** "This new hub will play a central role in our work to construct, demonstrate, and ultimately commercialize our KRONOS MMR™ Energy System in collaboration with the University of Illinois Urbana-Champaign. We are committed to using this facility to attract top talent from across the country to achieve our goals, and we're excited to continue growing our story in Illinois."

"The U. of I. has a long history of advancing nuclear energy innovation and research," **said Rashid Bashir, Dean of The Grainger College of Engineering.** "NANO Nuclear Energy's investment in a research and development facility in Illinois reinforces our leadership in this critical sector. Working with NANO Nuclear Energy and the state of Illinois, we'll deliver the technological advances and workforce development that will drive the future of nuclear energy."

Guided by Illinois' Economic Growth Plan, the REV Illinois program supports a targeted industry for the state – clean energy production and advanced manufacturing – which continues to expand because of strong state leadership and a commitment to fostering innovation, sustainability, and long-term economic competitiveness. The company will join a growing list of clean energy manufacturers that have recently chosen to expand or establish their business in Illinois, including Richardson Electronics and Pure Lithium. As part of the State's incentive package, NANO Nuclear received a REV Illinois tax credit for their capital investment and commitment to job creation, which can be found here.

"Illinois continues to lead the way in clean energy innovation and advanced manufacturing, and we're proud to welcome NANO Nuclear to our state's growing ecosystem," **said DCEO Director Kristin Richards.** "Through programs like REV Illinois, we're creating the conditions for cutting-edge companies to thrive while bringing high-quality jobs and transformative technologies to communities across Illinois."

For Full Official Press Release Press Here

CRITICAL PATH

U. of I./NANO Partnership

- Preliminary T&C
- Supporting Team
- Institutional Alignment

License Application

- Pre-App Engagement
- CP: PSAR & ER
- OL: FSAR

Fuel Procurement & Fabrication

- Fuel Fab. Facilities
- UF4 Supply (& Approps)
- Fuel Qualification

Site Preparation & Construction

- AE/Constr. Firm Selection
- MMR Manufacturing
- Abbott Integration

Commissioning & Operations

- Reactor Utilization
- Workforce & Op. Training
- Product Demonstration

PUBLIC ENGAGEMENT

Target Dates

- Engagement with NRC | Active
- Construction Permit Application | Q1 2026
- Issuance of CP | Q3 2027
- Operating License Application | Q3 2027
- Operations | 2029

ACES Perspective

DIA perspective on campus sustainability

DIA Updates

- Continue to work with partners
- Outside vendors: Oak View Group and Coca-Cola
- Reshaping behavior in tailgate lots
- Who is paying for infrastructure?

Gies Memorial Stadium Updates

Metal Recycling / Trash additions

204 Paired Cans

$132,000

Recycle Tops, $9,338

Continued Efforts

1) Be Orange, Go Green

2) Fighting Illini, Fighting Waste Campaign

3) Green Sports Alliance Membership

DIA Updates

DIA's Perspective

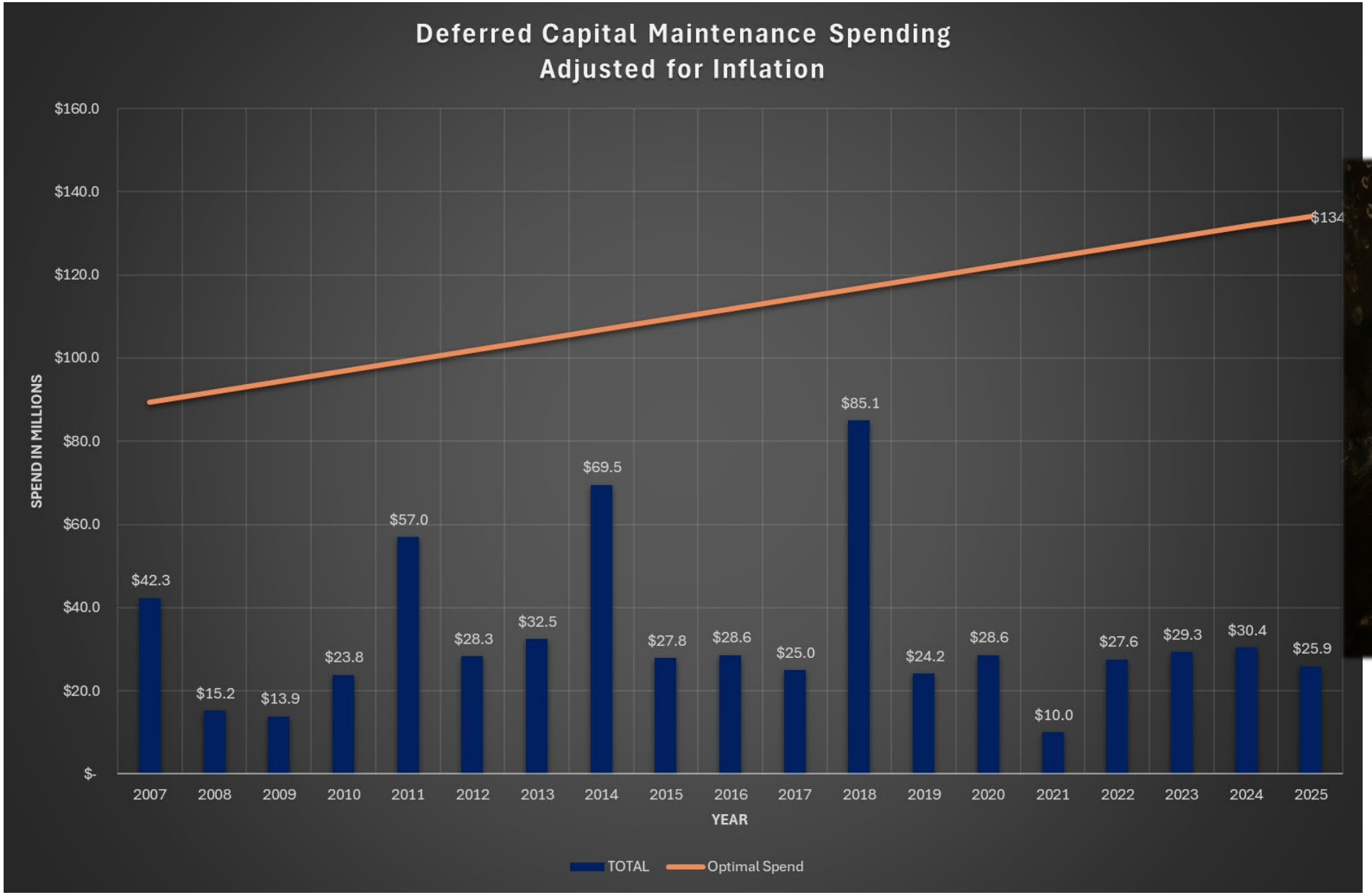
- Importance of campus sustainability efforts (Visibility)
- Future efforts – Tailgating
- Partnership with RSOs to help with recycling in the venues and out

Deferred Maintenance Burden and Energy Management

Campus Infrastructure is at a Crossroads

- Infrastructure is foundational to the University's Mission
  - Critical inflexion point
  - "Deferred Maintenance" backlog **~$4.8B**
- Avg Spending ~$29M/yr = 165 years to catch up
- To stabilize the infrastructure and not increase the backlog, we should spend about $134M/yr (in 2025 dollars)

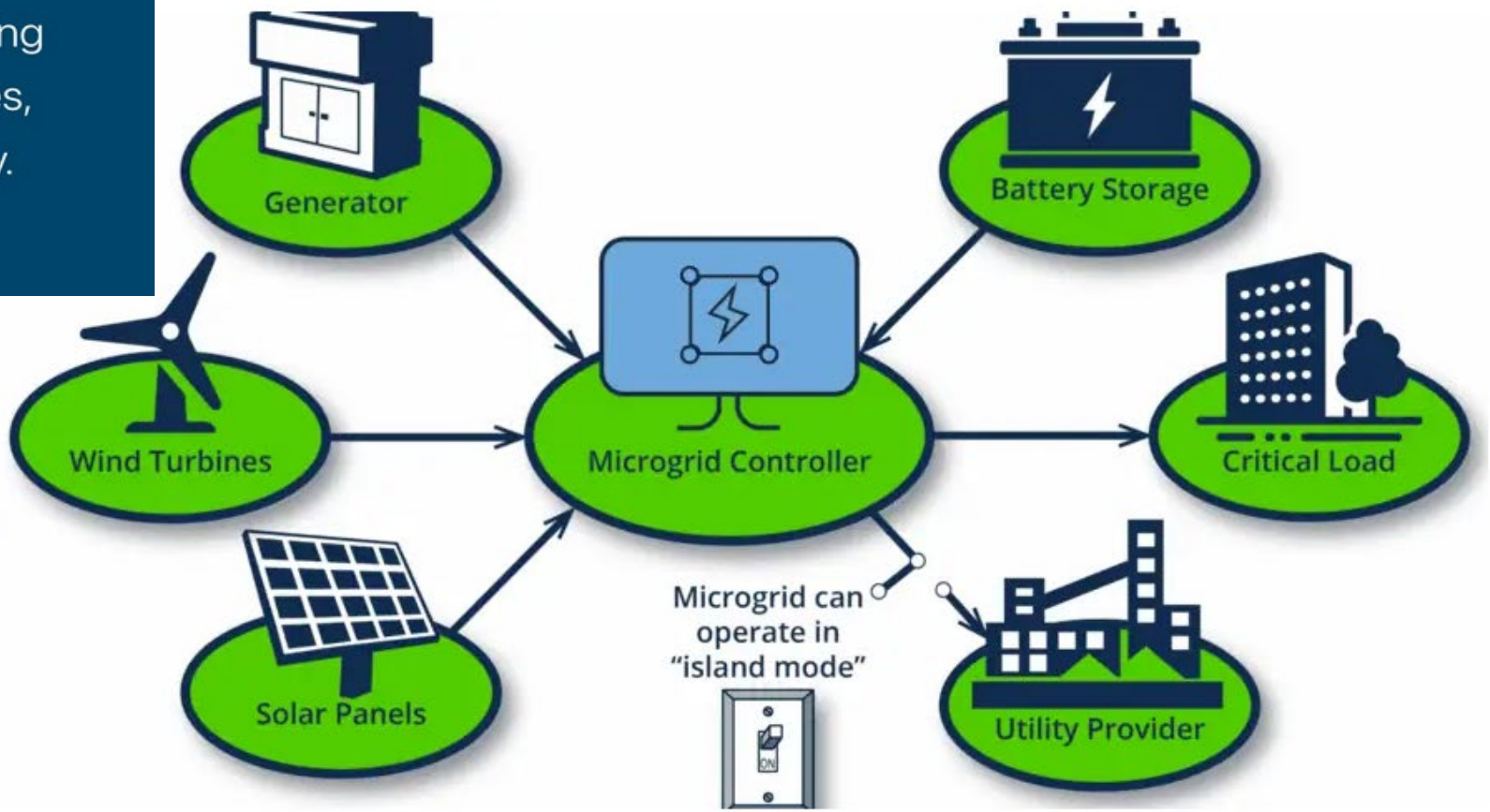
We need to consider the total cost of ownership for our built environment

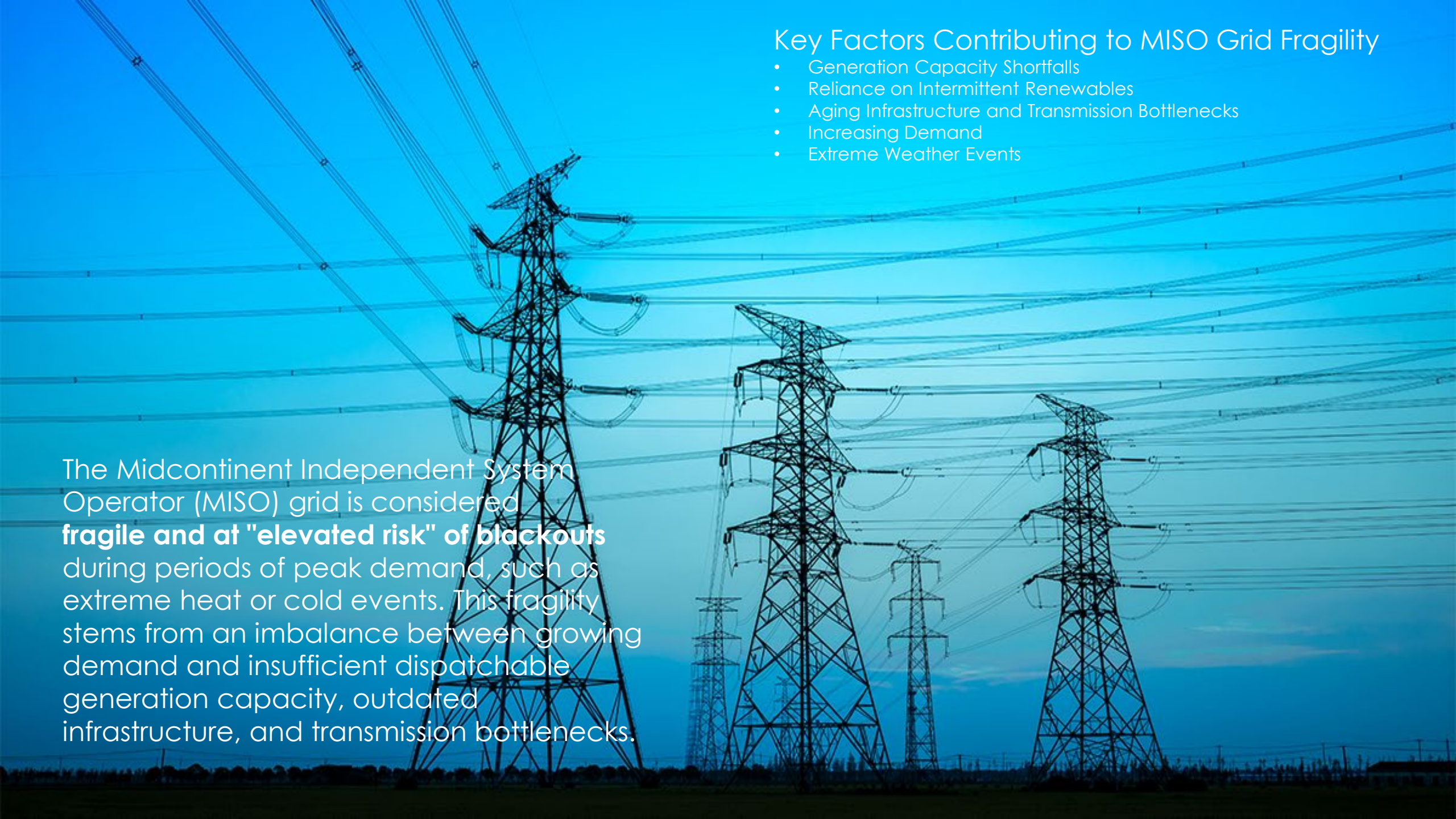


EXAMPLE:
TURNER HALL NEWEST AIR HANDLING UNIT (AHU) IS FROM 1975

Energy Management is also in a transitional period

Microgrids slash emissions by integrating renewables, cutting transmission losses, and boosting energy efficiency locally.





Key Factors Contributing to MISO Grid Fragility

- Generation Capacity Shortfalls
- Reliance on Intermittent Renewables
- Aging Infrastructure and Transmission Bottlenecks
- Increasing Demand
- Extreme Weather Events

The Midcontinent Independent System Operator (MISO) grid is considered **fragile and at "elevated risk" of blackouts** during periods of peak demand, such as extreme heat or cold events. This fragility stems from an imbalance between growing demand and insufficient dispatchable generation capacity, outdated infrastructure, and transmission bottlenecks.

F&S Alignment with iCAP

- Our F&S mission is to support the U. of I. mission
- The iCAP has been a key part of the campus strategy for 15 years, and it is integrated in the F&S operations
- It would be helpful for the Strategic Plan and the next Campus Master Plan to incorporate the iCAP goals

For Discussion

Campus Sustainability

Goals for Campus Sustainability

- Approval of the objectives specified in ICAP 2026
- Integrating these objectives into the Campus Strategic Plan, Master Plan and Energy Plan
- Ensuring resilience of energy systems through more on-campus low carbon generation
- Developing more circular systems to reduce and reuse food waste and agricultural waste for energy
- Energy conservation through addressing deferred maintenance
- Lower energy use intensity through smart utilization of space

Need Systematic Plan to Fund Campus Sustainability

- Prioritize investment in sustainability initiatives in the campus budget

- Pursue external funding opportunities as available:
  - Ameren Efficiency Program: $1,652,335 since January 2023
  - Illinois Climate Pollution Reduction Grant (CPRG), 2026
    - State awarded $430M to implement emissions reduction measures
  - Potentially from Inflation Reduction Act
    - Geothermal, battery storage opportunities are still available

- Explore private sector and donor funding for sustainability initiatives
  - As part of the next major capital campaign

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sustainability.illinois.edu