

An aerial photograph of a university campus, showing a dense collection of buildings, trees, and a large clock tower on the left. A white rectangular box is overlaid on the right side of the image, containing text.

INDIANA UNIVERSITY CLIMATE ACTION PLAN

IU CAP Committee Meeting

October 26, 2022

FOR IU CAP COMMITTEE USE ONLY



AGENDA

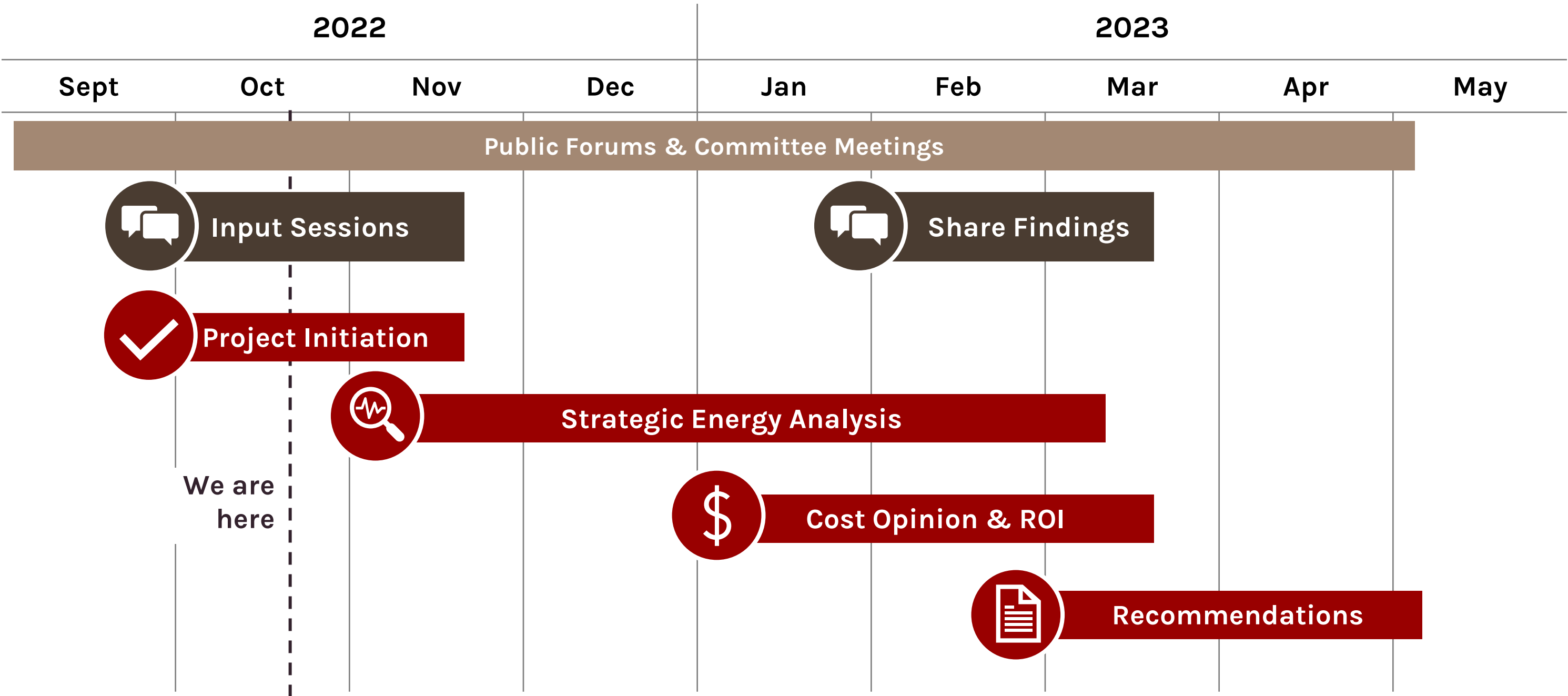
Public Forum Sessions

- Updates on Current Public Sessions

Data & Information

- Highlight work underway
- Data Collection Request
- Low-Hanging Measures to Start While we work

PROJECT SCHEDULE



We are here

PUBLIC FORUMS

Trip #1: Gary, Indianapolis, Kokomo

Date	Campus	Forum #	Event
September 27	IUN	1	Public Forum #1 + IUN Campus Tour
September 28	IUPUI	2	Public Forum #2 + IUPUI Campus Tour
	IUK	3	Public Forum #3 + IUK Campus Tour

Trip #2: Indianapolis, South Bend

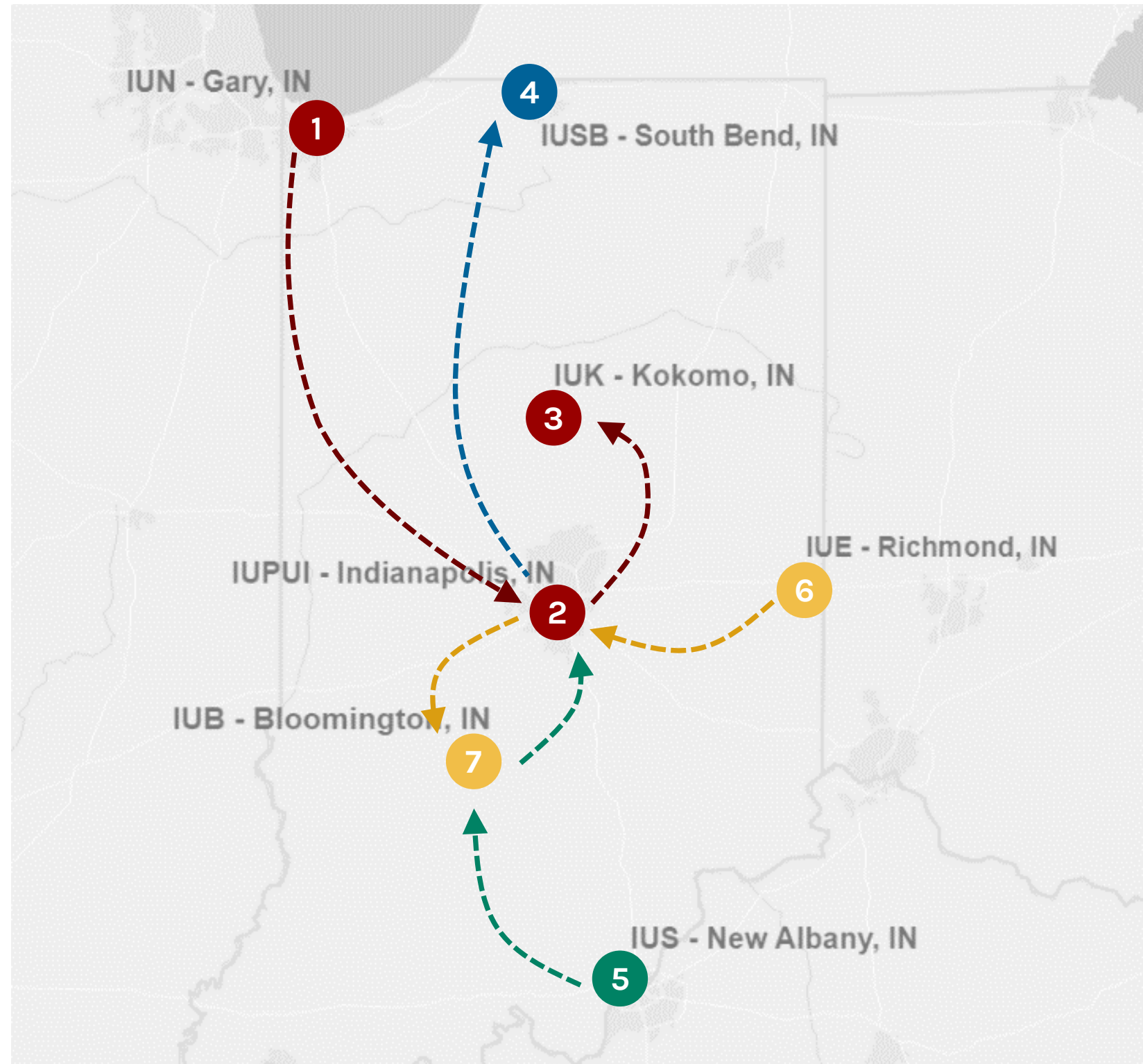
Date	Campus	Forum #	Event
October 11	IUPUI		Committee Meeting
October 12	IUSB	4	Public Forum #4 + IUSB Campus Tour

Trip #3: New Albany, Bloomington, Indianapolis

Date	Campus	Forum #	Event
October 25	IUS	5	Public Forum #5 + IUS Campus Tour
October 26	IUB		IUB Campus Tour
	IUPUI		Committee Meeting

Trip #3: Richmond, Indianapolis, Bloomington

Date	Campus	Forum #	Event
November 15	IUE	6	Public Forum #6 + IUE Campus Tour
	IUPUI		Committee Meeting
November 16	IUB	7	Public Forum #7



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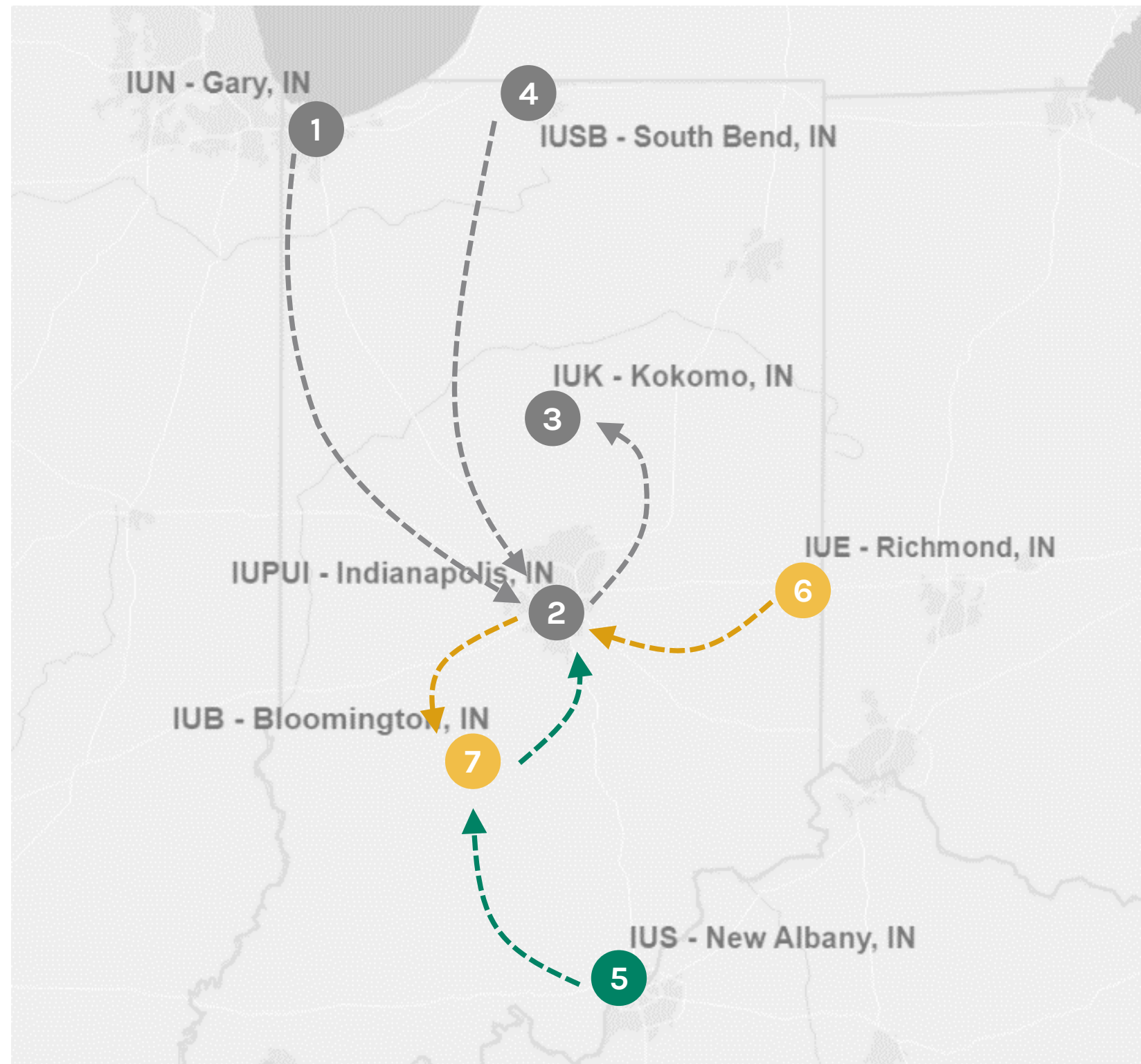
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SURVEY QUESTIONS

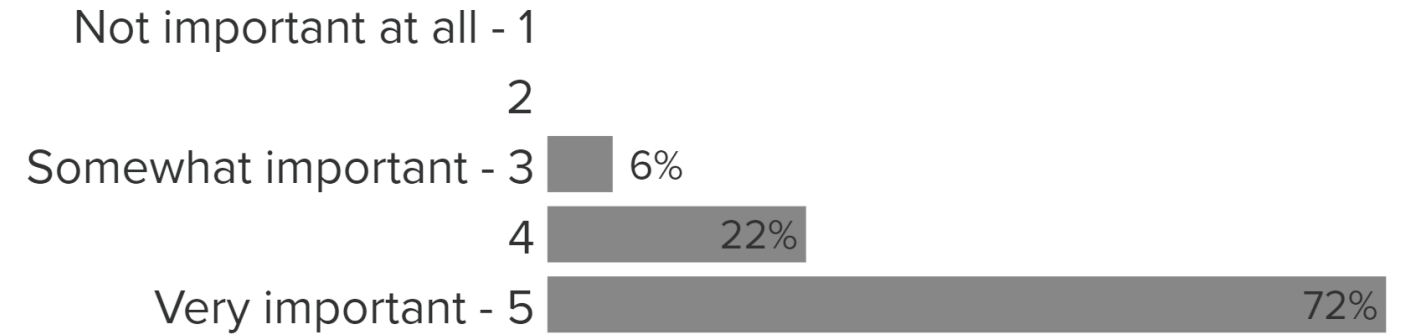
COMPARING INPUT

On a scale of 1-5, how important do you think the topic of climate change is to our present and future?

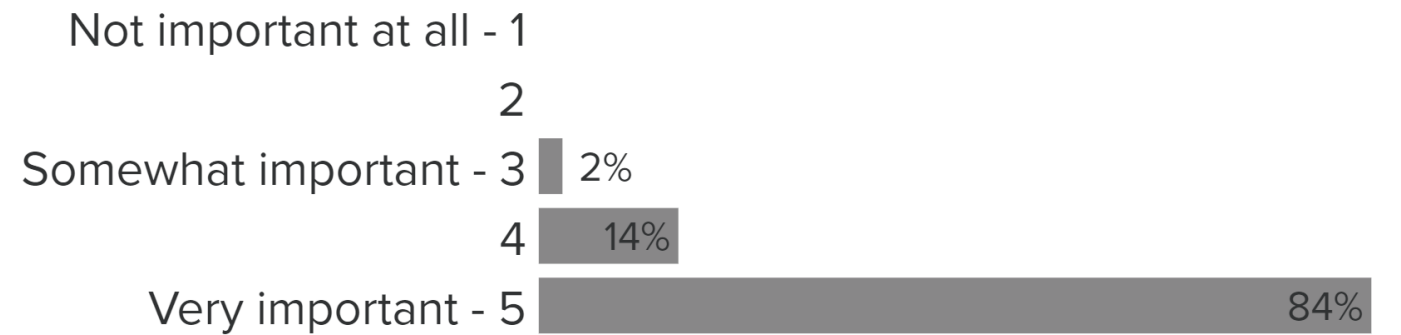
IUSB – SOUTH BEND



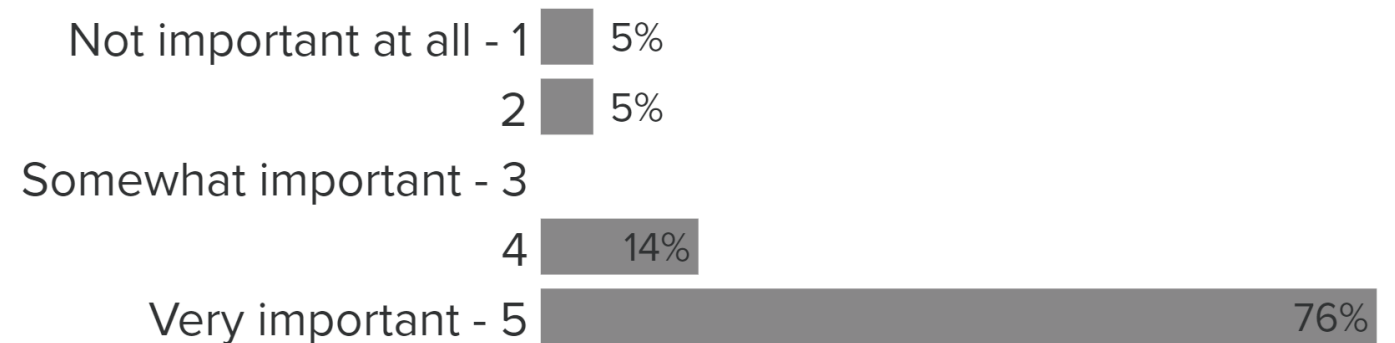
IUN – GARY



IUPUI – INDIANAPOLIS



IUK – KOKOMO

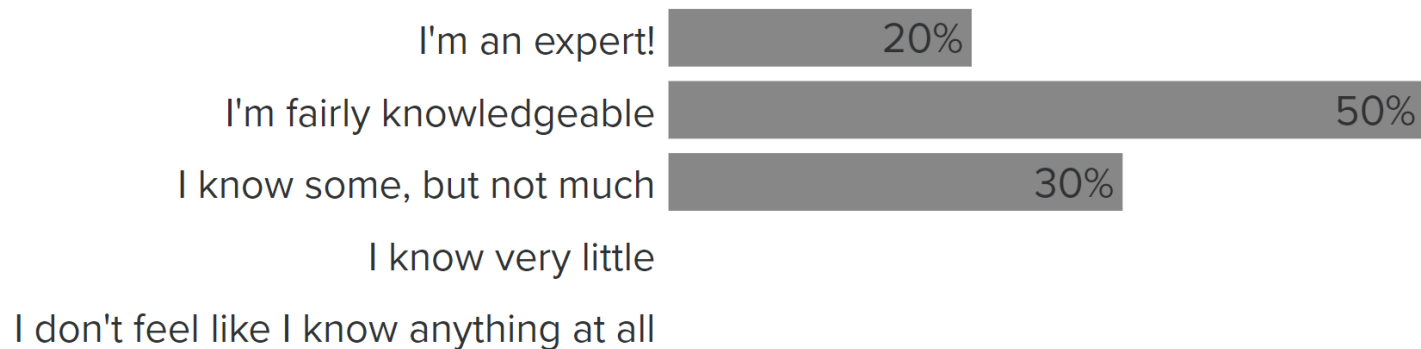


SURVEY QUESTIONS

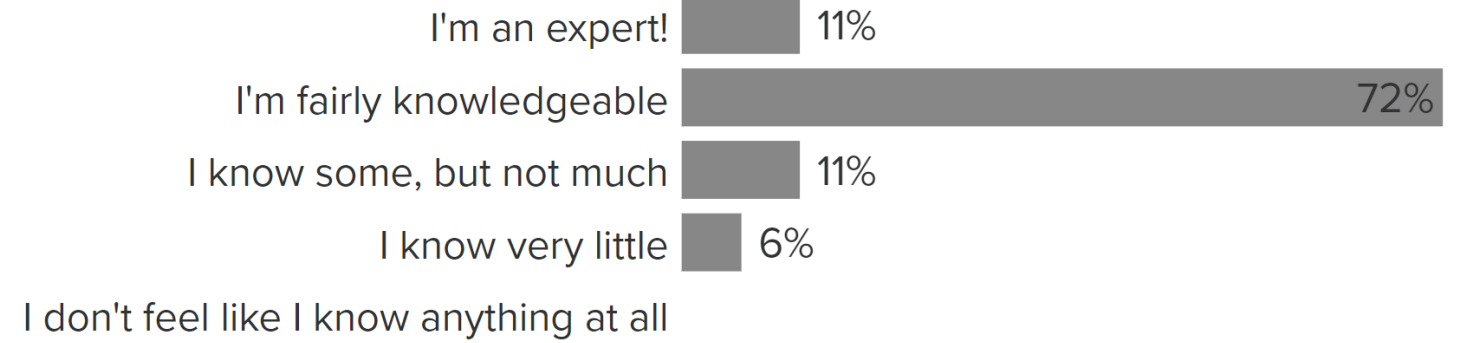
COMPARING INPUT

How comfortable are you with your knowledge around the topic of climate change?

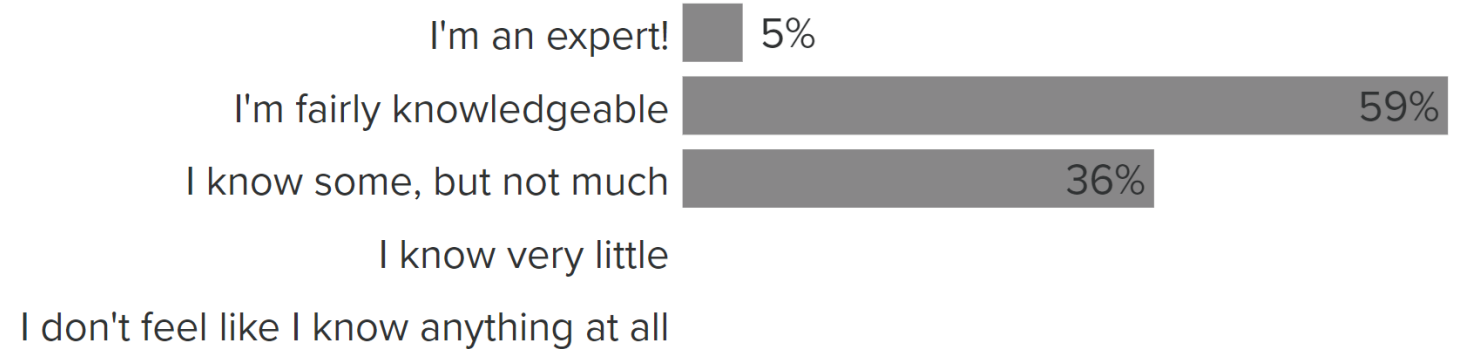
IUSB – SOUTH BEND



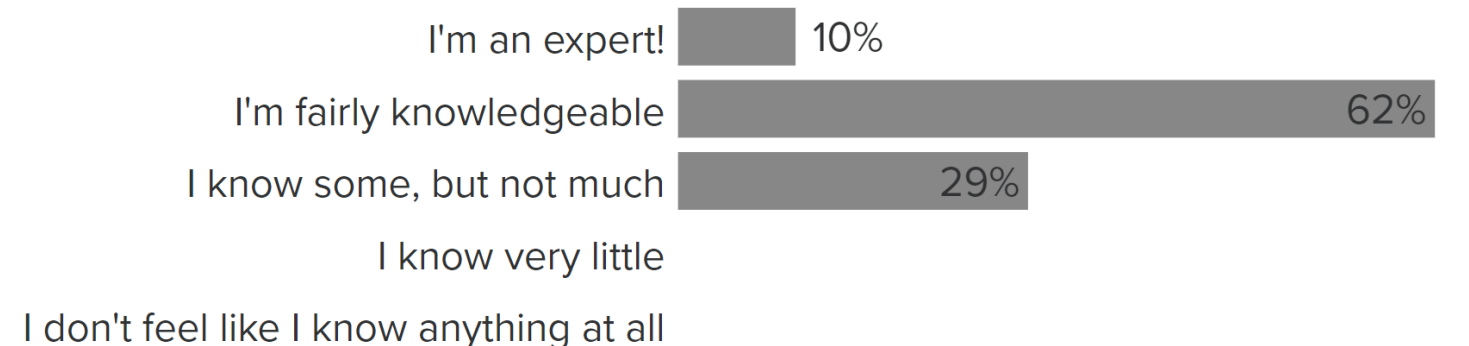
IUN – GARY



IUPUI – INDIANAPOLIS



IUK – KOKOMO



SURVEY QUESTIONS

COMPARING INPUT

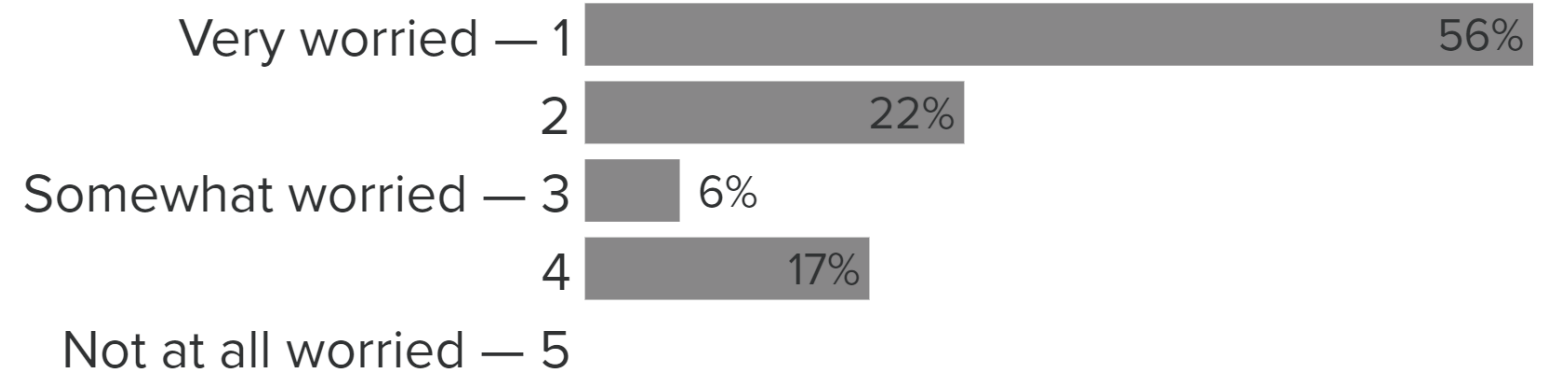
On a scale of 1-5, how worried you are about your future with regard to climate change?

IUSB – SOUTH BEND

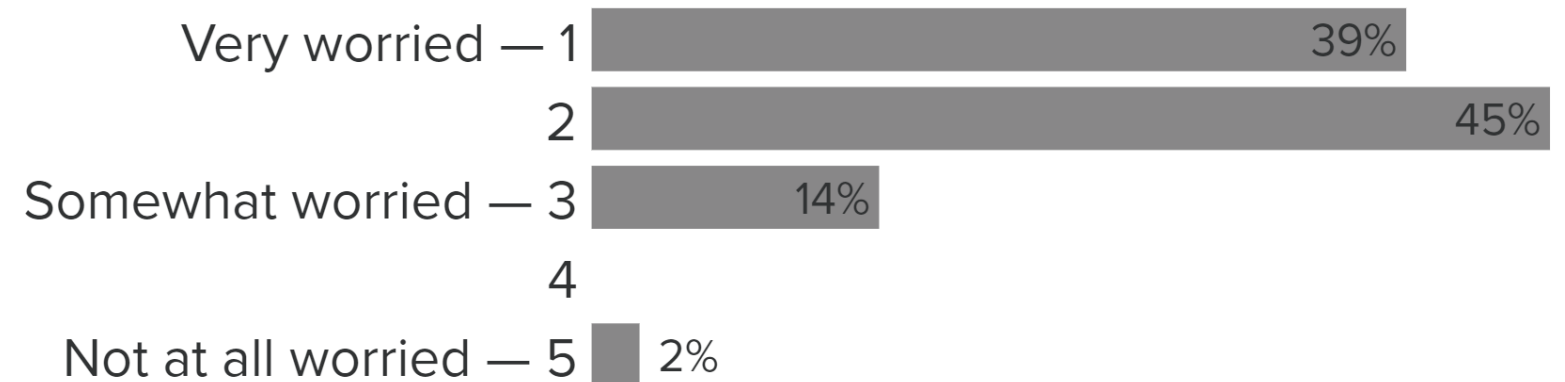
Note: Number scale inverted for below and remaining public forum sessions



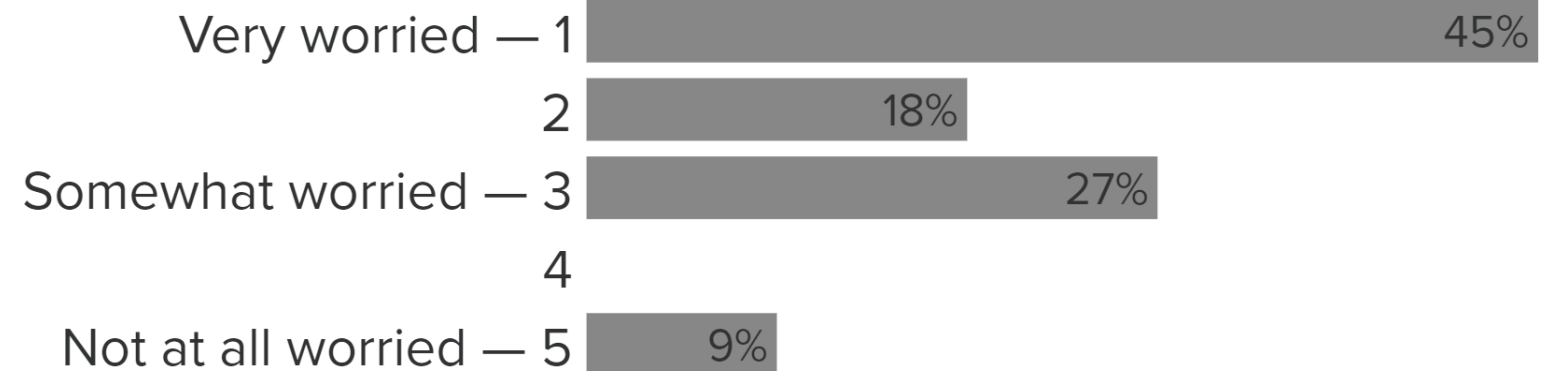
IUN - GARY



IUPUI - INDIANAPOLIS

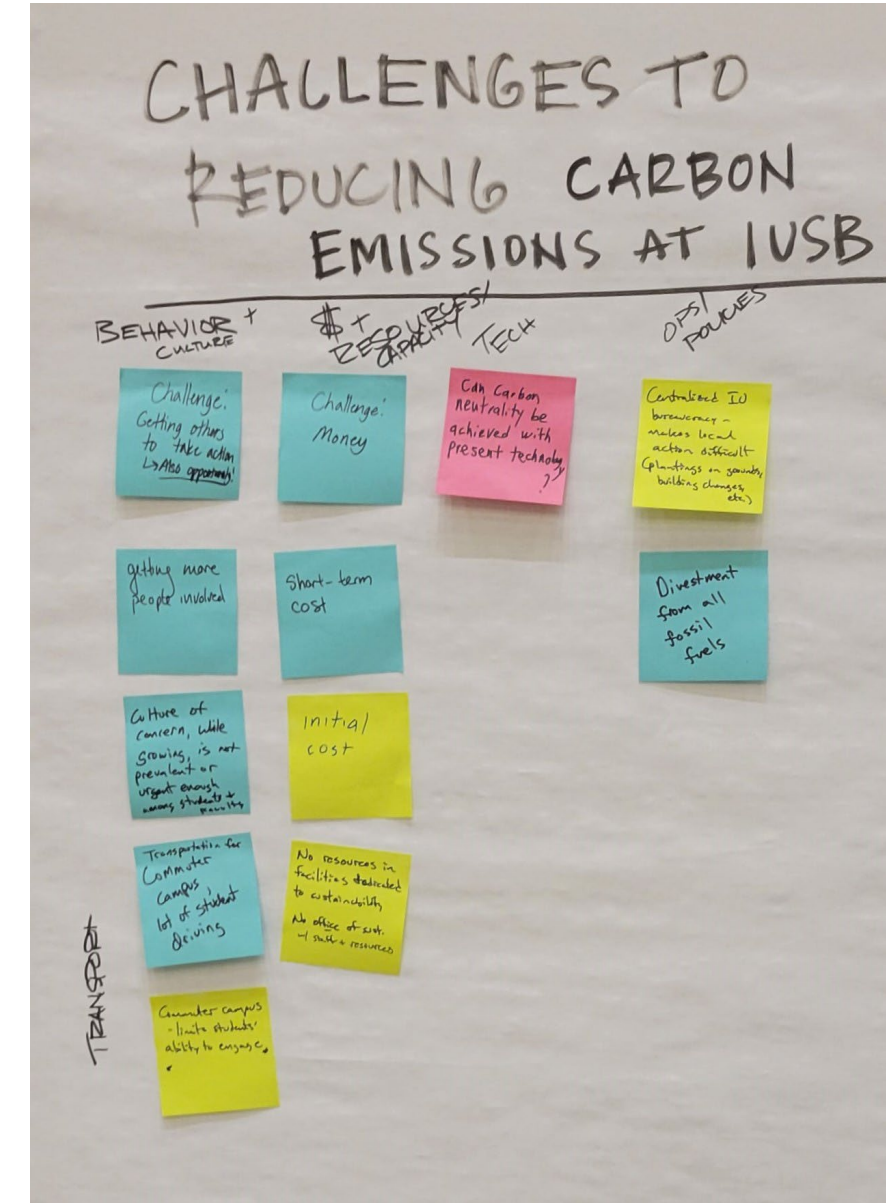
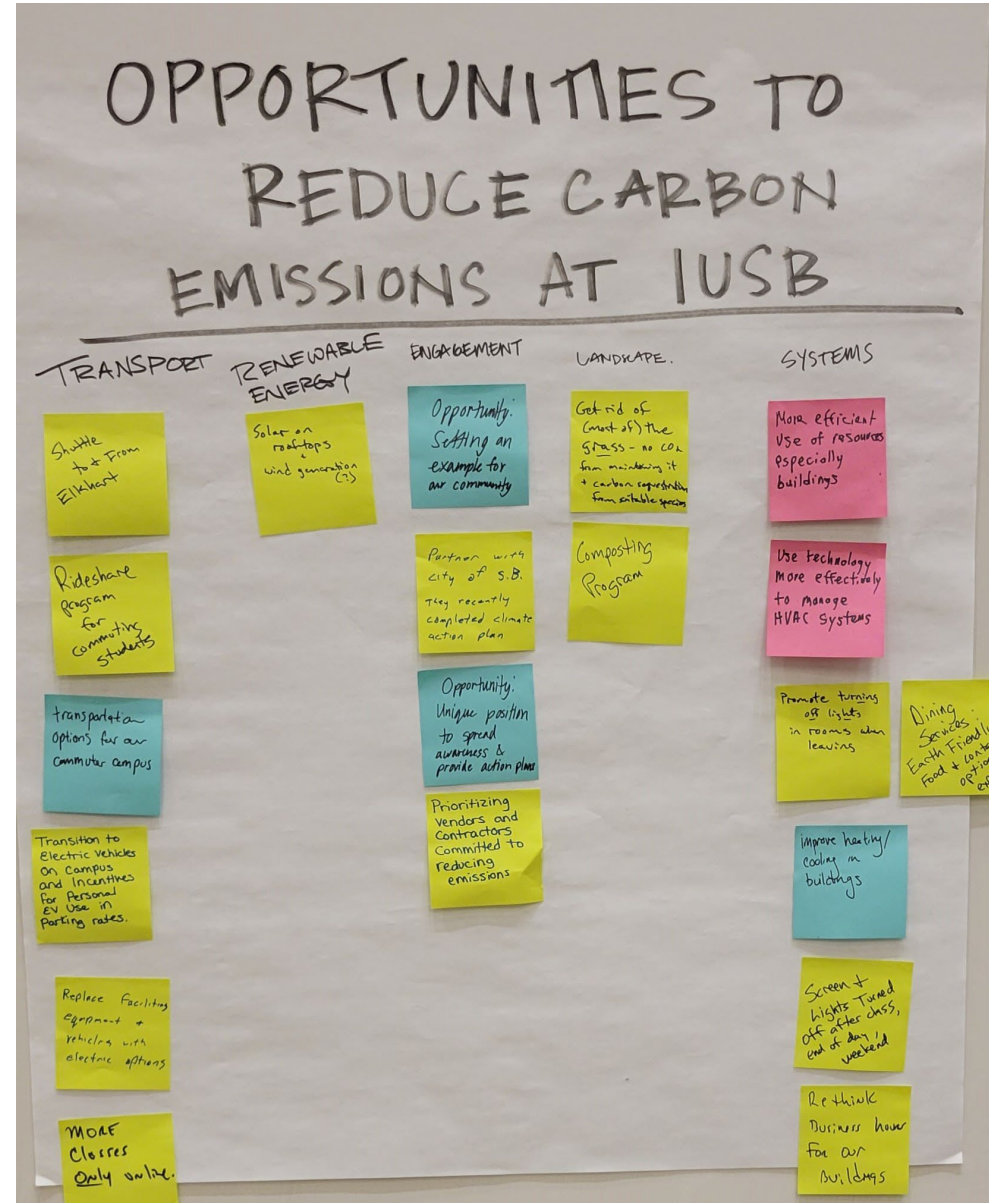
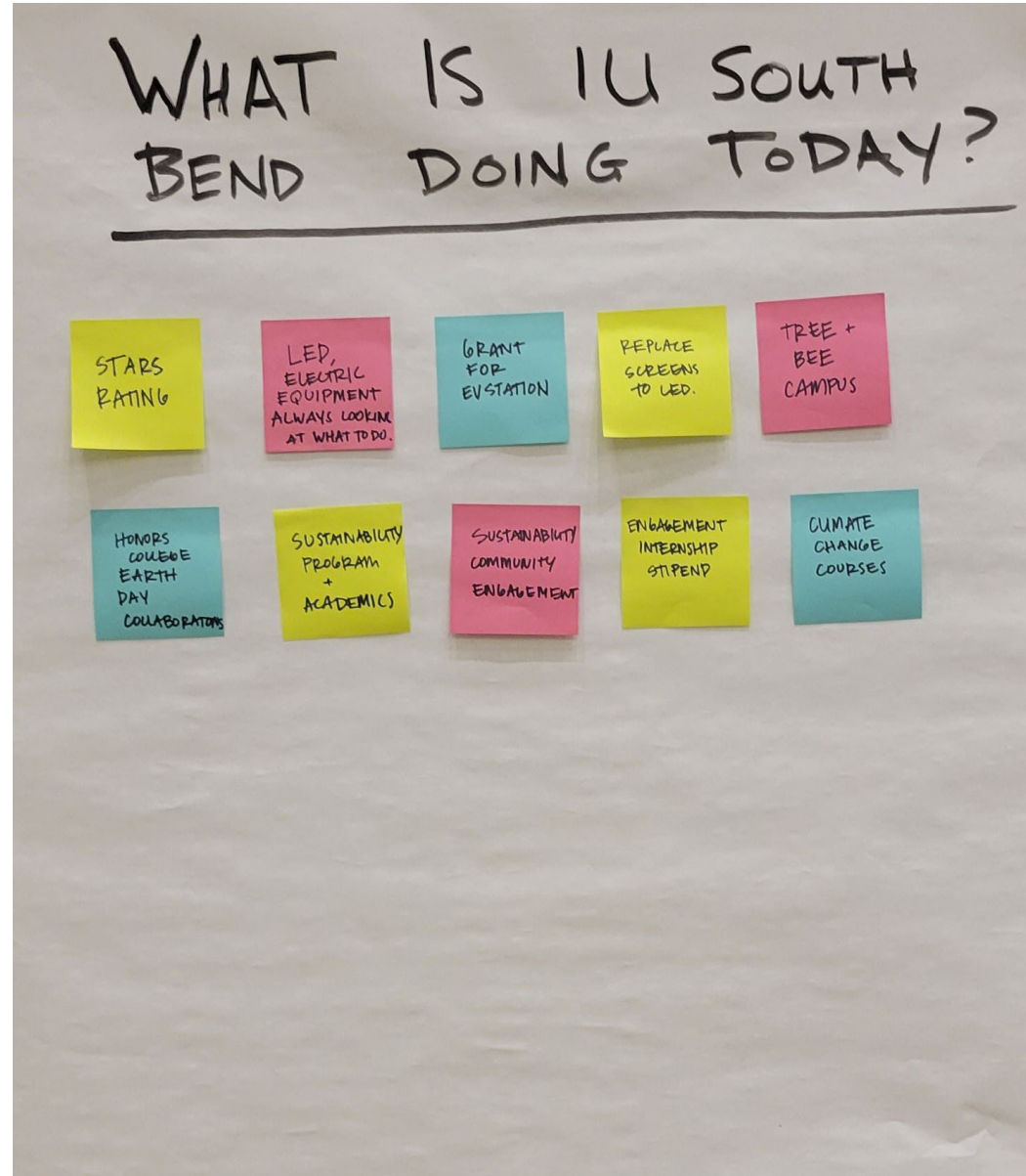


IUK - KOKOMO



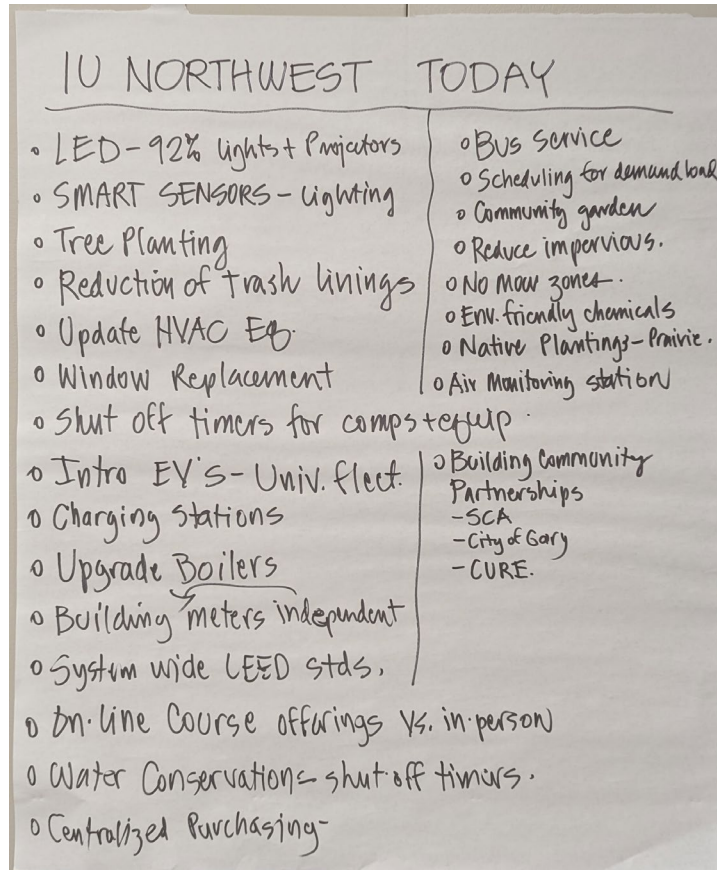
IU-SB RECAP

SESSION OVERVIEW

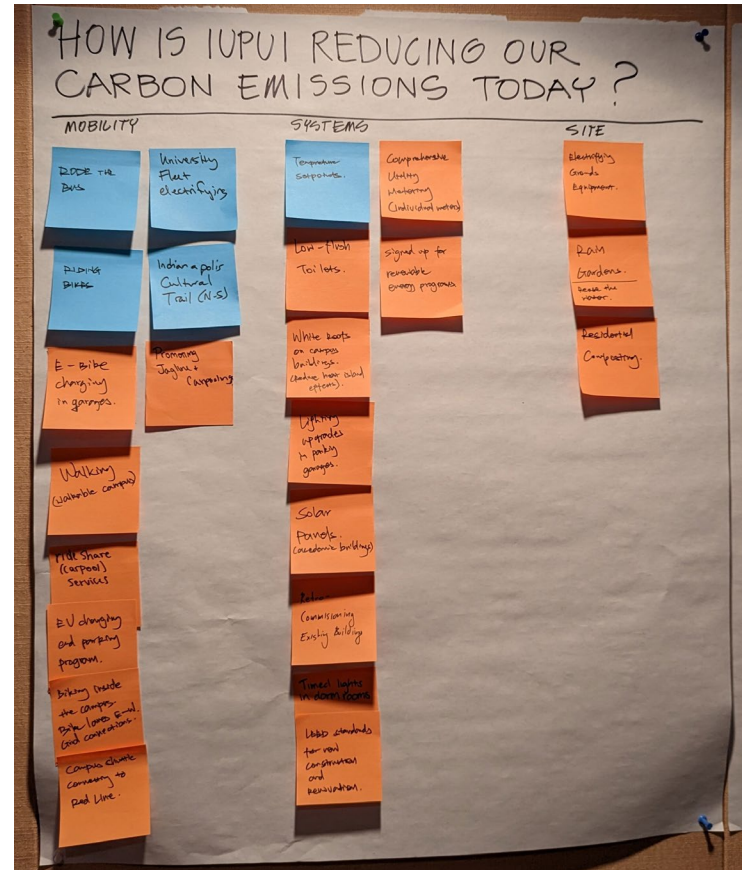


WHAT ARE YOU DOING TODAY?

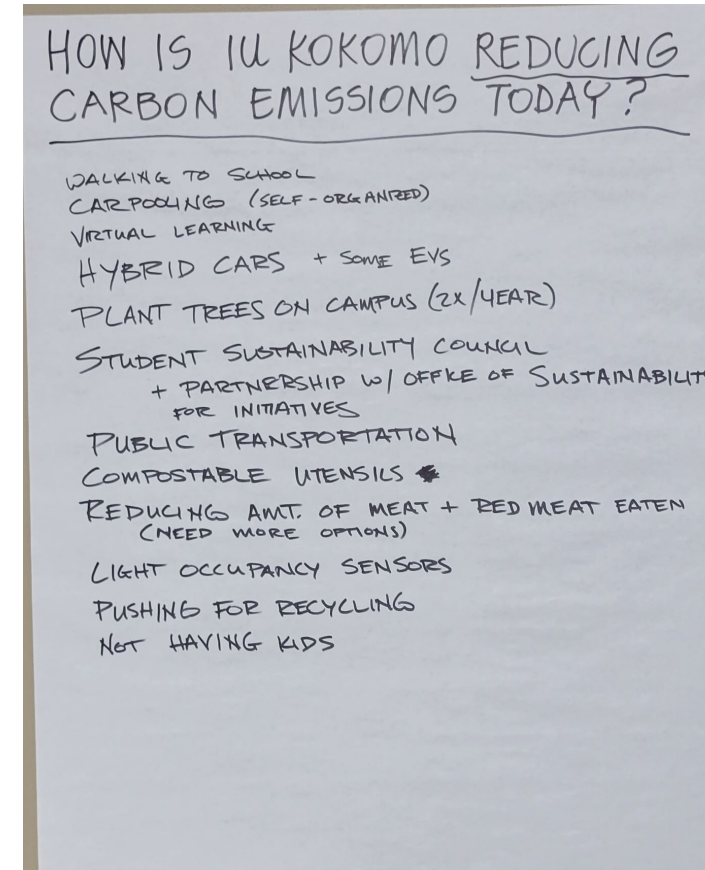
PUBLIC FORUM INPUT QUESTIONS



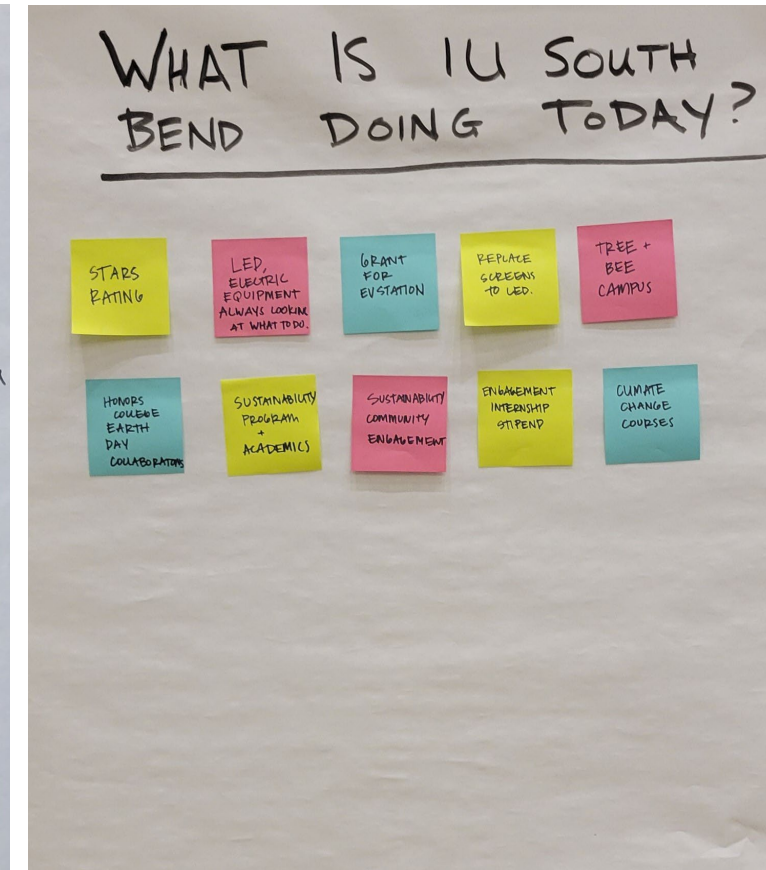
IUN - GARY



IUPUI - INDIANAPOLIS



IUK - KOKOMO



IUSB - SOUTH BEND

DATA AND INFORMATION REQUESTS

- Understanding what we have
- Identifying data and resources needed to complete the IU CAP



Campus (short)	Year	Cost (\$)	Initiatives	Future System Upgrades	Key Challenges	Opportunities
IUSB			<ul style="list-style-type: none"> Administration Building Renovations (multiple phases) Vera Z. Dwyer Hall Renovation (formerly Riverside Hall) Northside Hall renovations Roof Replacements/Repairs Parkside, Administration, Weikamp Exterior Stone Repairs/Envelope Weikamp, University Center Mechanical Systems Upgrades Schurz Library, Administration, Northside 	<ul style="list-style-type: none"> Mechanical Systems Replacement (Northside) Auditorium Theater Lighting Upgrades (Northside) Hardscape Upgrades (University Center) Entry Door Replacement (Weikamp) Phase 1 Campus Walkway Lighting Parkside Hall Renovation 		
IUN			Energy Reduction Projects <ul style="list-style-type: none"> Completed ~17 projects with impact on campus energy consumption from October 2019 to date 90% of interior campus lights converted to LED (Dunes, Hawthorn Hall) Outside/exterior lights on campus are 100% LED Impact of demand load of system and peak period billing 	Major Energy Projects (2020 - 2023) <ul style="list-style-type: none"> Marram Hall window replacements Hawthorn Hall natural gas conversion and electrical renovation Raintree Hall -HVAC system replacement Facilities Services Electrical and HVAC upgrades (2022-23) Facilities Services Annex HVAC upgrades (2022-23) Tamarack Green Space Internal/external LED replacement program ongoing, 90% complete Hawthorn Hall window seal replacement Add sidewalk lighting to south 35th Avenue Savannah hot water heater relocation Raintree Hall classroom and corridor renovation Marram Hall classroom/corridor/lab renovation Marram Hall boiler replacement Various other projects 	<ul style="list-style-type: none"> Winter weather tough on equipment (Limit exposures resulting in frozen/broken coils and water lines) Little Calumet River flood of 2008 led to demolition of Tamarack Hall Degraded air due to proximity of state highway Availability of new staff, turnover of workforce, and loss of experience Budget restrictions or reductions related to student retention Space planning and space utilization Sewer back up - Gary Sanitation 	<ul style="list-style-type: none"> Standardization of Intra-campus processes Enhance the effectiveness of our staff Improved energy reduction Shared knowledge base between IU campuses Provide responsible stewardship Commit to sustainable practices (hand driers vs. paper towels) City of Gary conversion of buses to natural gas - green transportation solutions for students Planting trees to help manage stormwater and improve infiltration and offset carbon emissions Opportunity to become a charging hub under city initiative Converting all campus lighting to 100% LED
IUK			Projects & Initiatives (2015 - Present) <ul style="list-style-type: none"> Kokomo Main Building - Renovation (2016) Library Renovation (2017) Student Activities and Events Center (2021) New Campus Greenhouse (2021) System Upgrades <ul style="list-style-type: none"> Kelley Student Center/Library/Art Gallery AHU Replacement Multiple Buildings: Replacing pumps, frequency drives and motors Main Building: Replaced Roof with TPO roofing and added insulation Fine Arts Building: Replaced all single pane windows with double pane and insulated storefront glass system Student Activities and Events Center - Air Handlers and Systems Examples <ul style="list-style-type: none"> Kokomo East Building - Bank of 6, small fans replaced single, high horsepower fan. Frequency drives now control the need and can be staged for operation and increases efficiency as well as mechanical redundancy. Coordinated recycling program and reduced water landscape management program Water absorbing beads reduce watering demand by 60% for flowers and hanging baskets 	<ul style="list-style-type: none"> Window replacement in portions of East Building KSC/Library Air Handling Units (2) Fine Arts Building Roof Top Heating and Cooling Units Hunt Hall Roof - White TPO Roofing Hunt Hall/Balance of Main Building - Upgrade to DDC controls Upgrade of campus HVAC Controls to new Siemens system with more control options to improve efficiency. 		

WORK UNDERWAY – NEXT STEPS

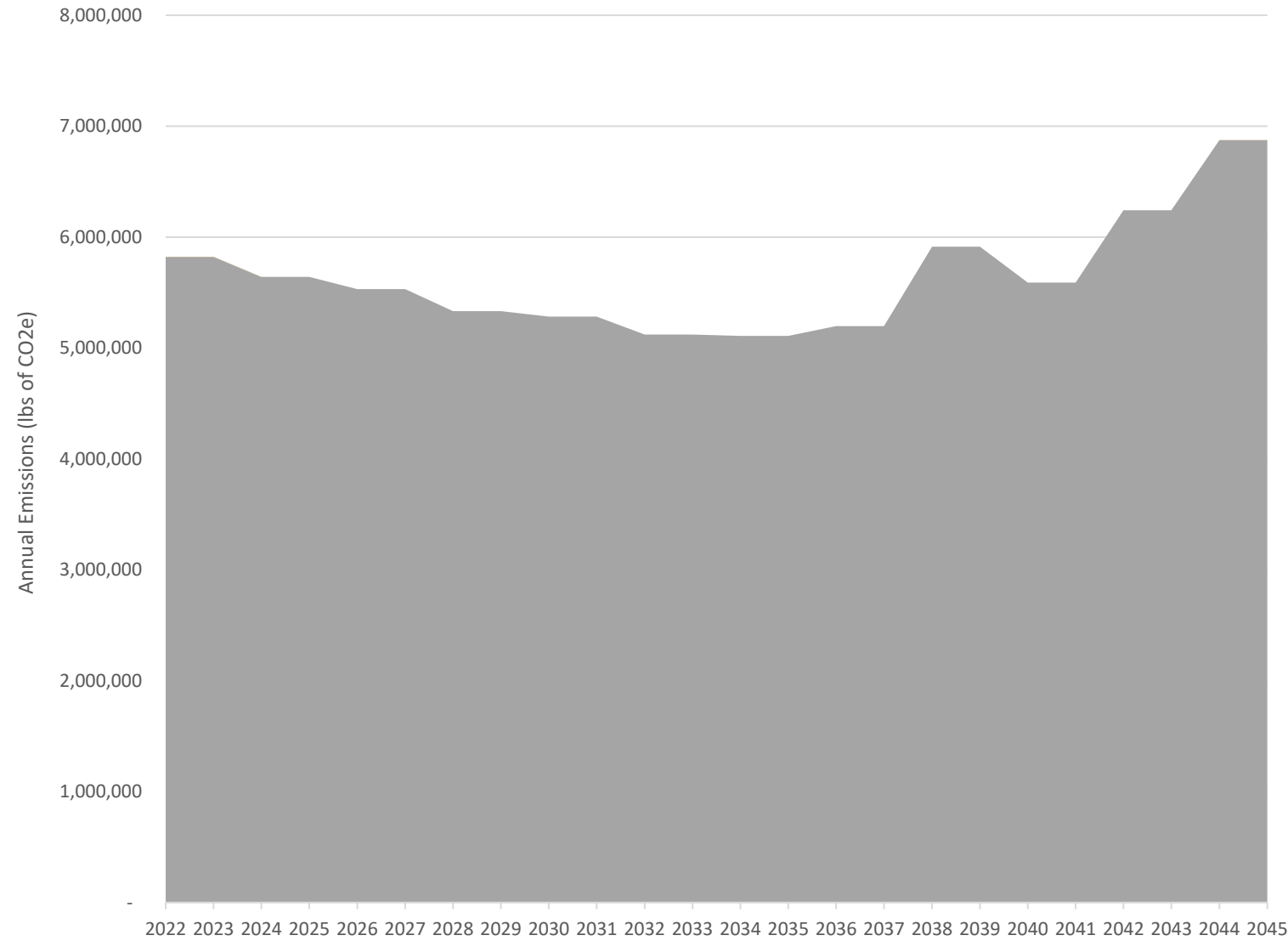
DIGGING INTO THE DATA

Information Collection List				ITEM STATUS
These items are necessary for the campus planning effort, and should be provided at the start of the project.				Requested
				Received
				Not Available
ITEM	WHEN NEEDED	PREFERRED FORMAT	NOTES	STATUS
If data/information is available on a publicly accessible website, please simply note URL.				
01 - GENERAL PLANNING DATA				
A - Site and Environmental Information				
Campus-Wide Base Maps	At the start	AutoCAD or GIS (State Plane Coordinate System preferred). If not, PDF or Jpeg formats.	Map data on the following: utilities, easements, buildings, parking, land use, roads, walks, natural features (such as topography, vegetation, water bodies, floodplains and wetlands), and university boundaries of land ownership	
Campus and Property Inventory	At the start	Excel	Organized by: <ul style="list-style-type: none"> • Building ID (typically a building number and/or alpha) • Building Name • Building Address • Owned / Leased • GSF - Gross Square Feet • ASF - Assignable Square Feet 	
02 - OPERATIONS				
A - Strategic Plans / Capital Projects				

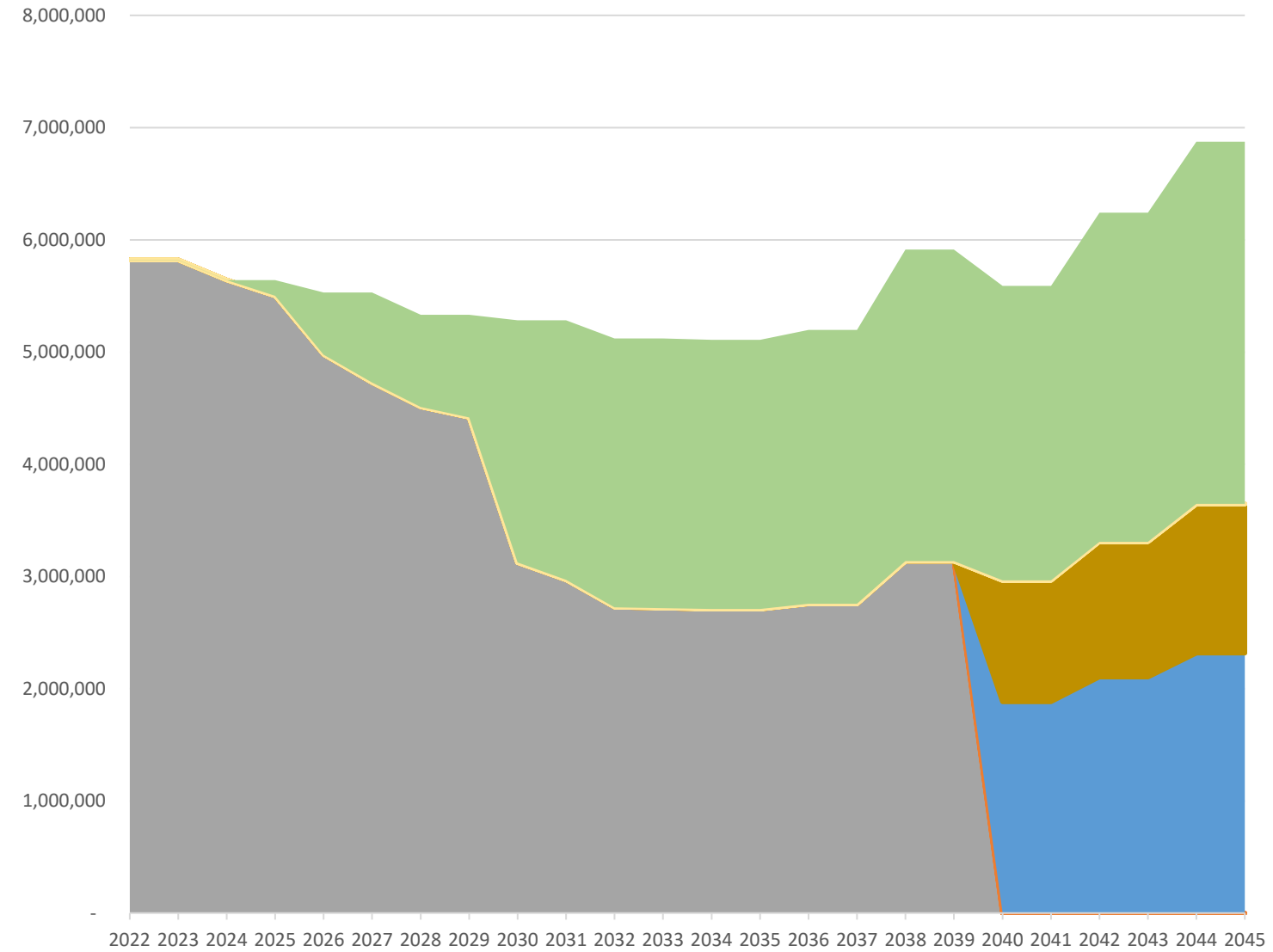
WORK UNDERWAY – NEXT STEPS

USING YOUR DATA TO PROJECT OUT BAU AND IMPROVED SCENARIOS

Business as Usual + Electrification



BAU + ECM + PV + Offsets (Electrification)



LOW HANGING OPPORTUNITIES

The goal is to have high visibility demonstrations and student engagement align with the release of the Climate Action Plan

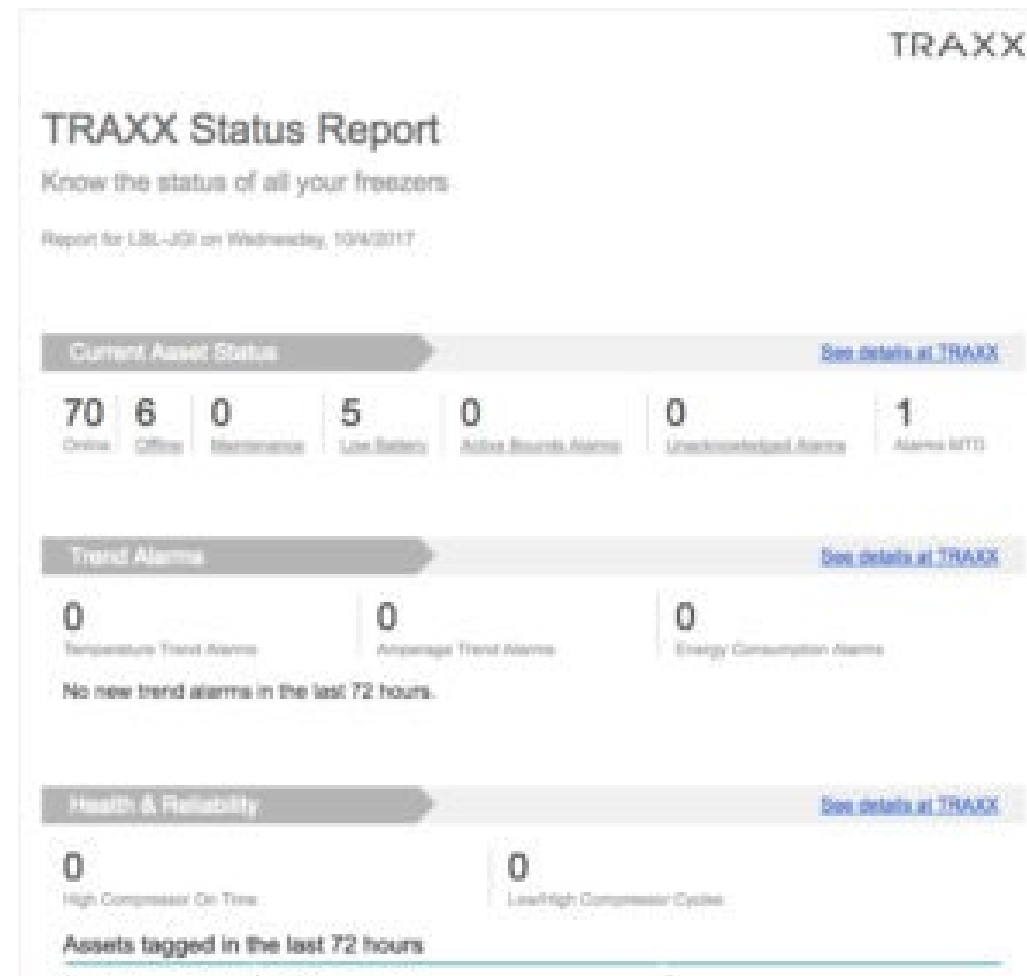
- Celebrate Accomplishments

Number of Projects by Campus

<i>Project Type</i>	BL	EA	IN	KO	NW	SB	SE
Foundation	1	1			1		1
Building Structure	9		1			2	
Building Envelope	43	3	38	5	4	2	3
Roof	99	1	21	4	2	4	
Windows	25		10	5	4		3
Interior Construction	65	6	27	2	9	5	4
Classrooms	23	5	17	1	1	2	
Elevator and Lifts	42	2	15		2	2	1
Plumbing	71	2	17	1	8	3	2
HVAC	154	3	106	9	15	13	12
Fire Protection	52	4	24		2	4	1
Electrical	161	5	24	4	6	3	1
Equipment	34	3		1	9	3	
Site Preparation	6		2			2	
Utilities	38		9		3		1
Hardscape	115	8	26	1	5	2	7
Landscape	24	2	10		1		1
Water Utilities	8		3				1
Sewer Utilities	15		6				
Stormwater Utilities	24		3		1		1
Steam Production/Distribution	47		7				
Chilled Water Production/Distribution	24				4		
Electricity Production/Distribution	26		19		1	1	
Site Lighting	18		8	1			

LOW HANGING OPPORTUNITIES – OPERATIONAL & MAINTENANCE

- Thermostat Setpoint Adjustments (Cautiously)
- Space Utilization Informed Class Scheduling – Tighter “open hours”
- Student Dorm Shower Head Replacements
- Lavatory Aerator Replacement
- Refrigeration Monitoring – (Commercial kitchen and Industrial)
- SmartPlug Strips with Motion Sensors to power Monitors
- Laptops in lieu of Desktops
- Fume Sash Closers



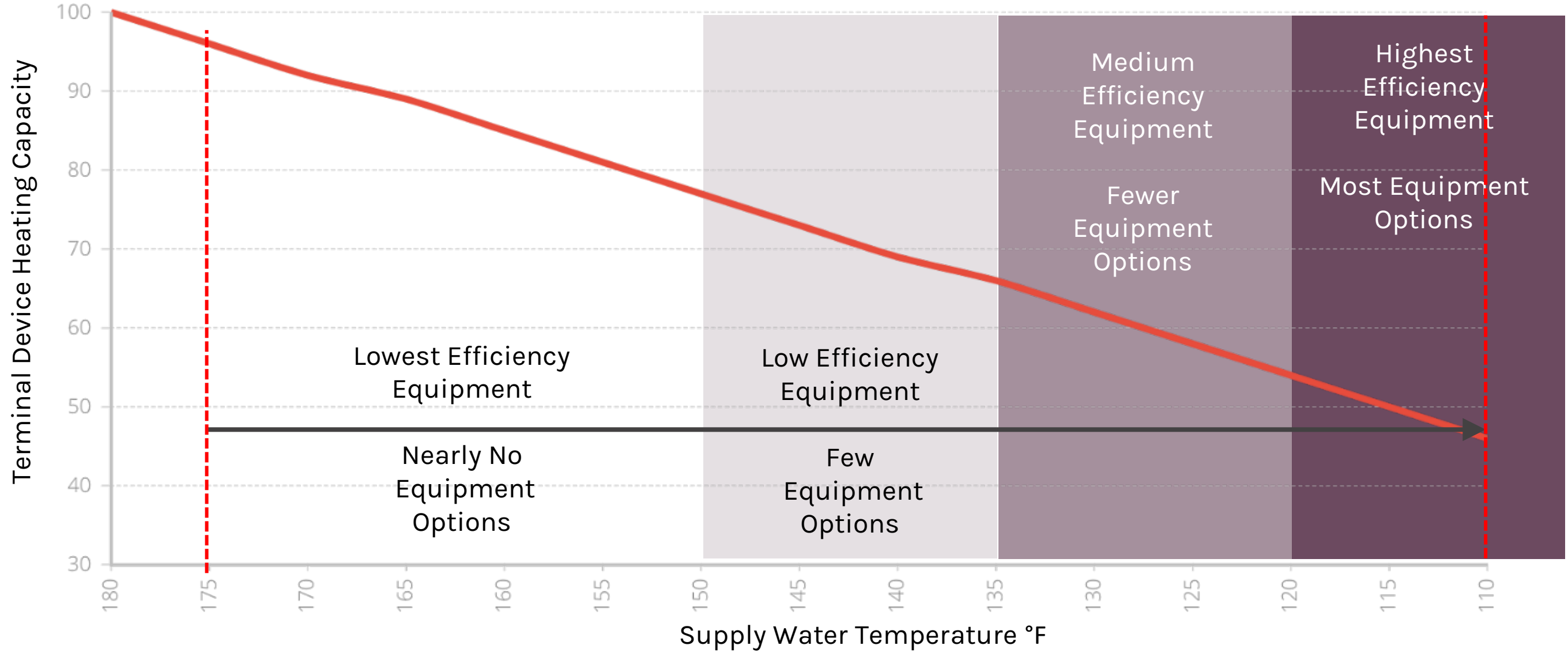
LOW HANGING OPPORTUNITIES – STUDIES AND DEMONSTRATIONS

- Wintertime Heating Hot Water Supply Temperature Stress Test @ sample Bld
 - Enabling Low Entropy Conversions
- Commercial Kitchen Energy Star Equipment Replacement Program
- Commercial Kitchen Heat Pump Water Heater Demonstration
- Investigate Utility Options for Bio-Gas & Renewable Gas



WINTERTIME STRESS TEST

HHWS TEMPERATURE REGIME TEST → REDUCING INVESTMENT COSTS



LOW HANGING OPPORTUNITIES – STUDENT ENGAGEMENT

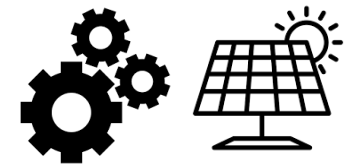
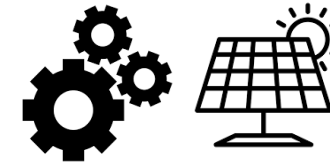
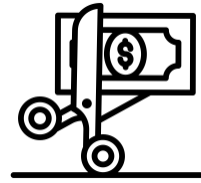
- Establishment of a Student-Run Sustainability Fund for EEM Projects
 - Seed Money; Revolving-funding through savings
- Student Run Energy Audits
 - IR Themography, Blower door Tests, etc.
- Energy Dashboards

- Solar Device Charging Station Design Competition & Fabrication



FINANCIAL TOOLS TO MAKE IT HAPPEN

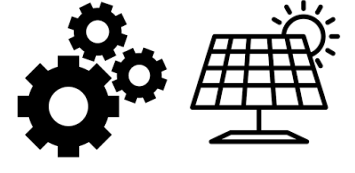
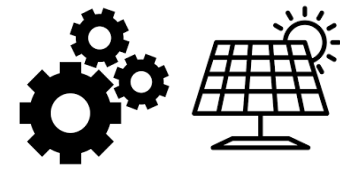
UPCOMING OPPORTUNITIES IN THE IRA TAX BILL – DIRECT GRANT PAYMENTS



		179D Commercial Building Energy Tax Deduction	Modified Accelerated Cost Recovery System	Bonus Depreciation	Business Energy Investment Tax Credit	Renewable Energy Production Tax Credit	Rural Energy for America Program Grants
Basic Project Attributes	Project Type	New Construction	New Construction	New Construction	New Construction	New Construction	New Construction
		Retrofits	Retrofits	Retrofits	Retrofits	Retrofits	Retrofits
	Eligible Technology	Energy Efficiency	Energy Efficiency	Energy Efficiency	Energy Efficiency	Renewables	Energy Efficiency
			Renewables	Renewables	Renewables		Renewables
			Energy Storage	Energy Storage	Energy Storage		Renewables
	Eligibility Notes	Envelope, HVAC, Hot Water, Lighting	Equipment or property must largely be used for commercial purposes	Recovery Period for depreciation must be less than 20 years	Technology Dependent	As of 2022, only applicable to wind energy	Only available to Rural Businesses or Agricultural Producers

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