

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 11, 2022

FOR IU CAP COMMITTEE USE ONLY



AGENDA

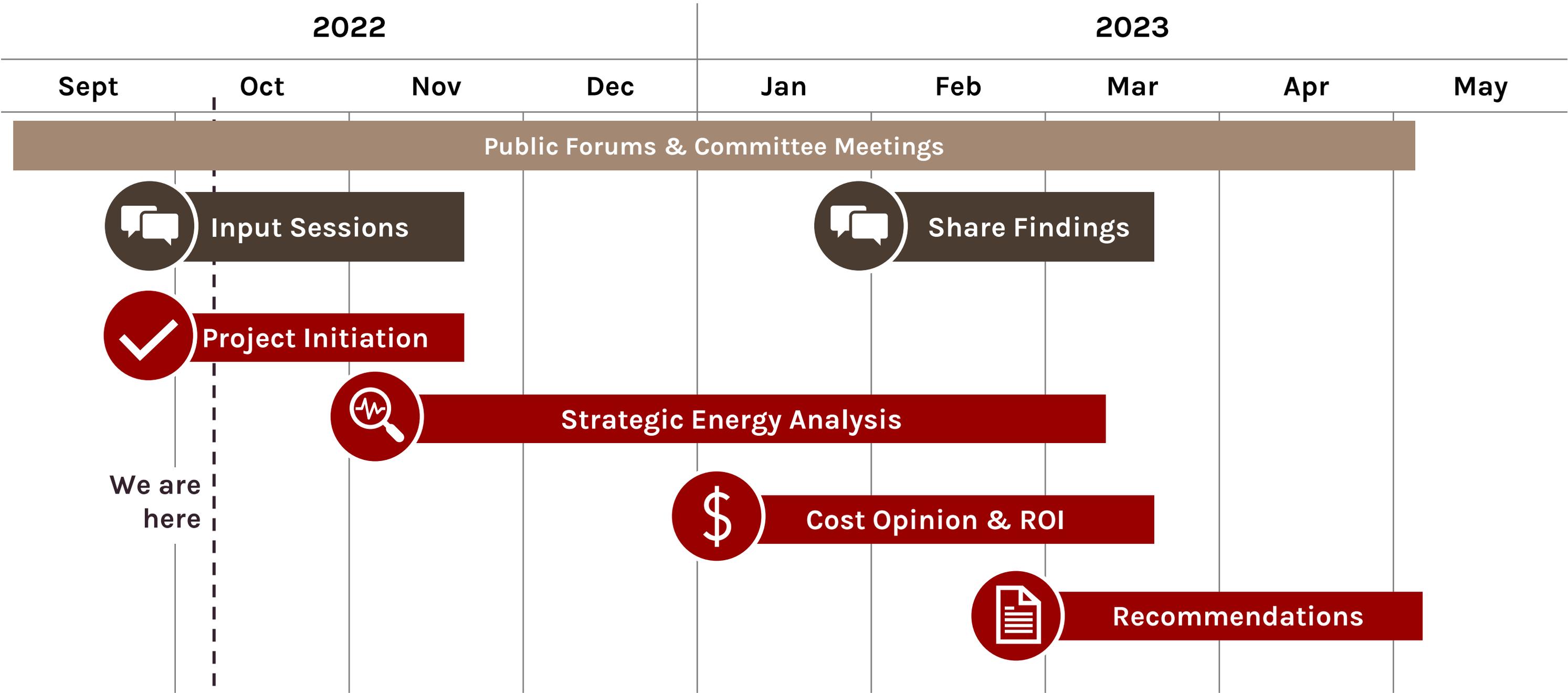
Public Forum Sessions

- Recap first round of Public Forum sessions
- Review format of sessions and how sessions changed
- Start to highlight input received thus far

Data & Information

- Highlight work underway and next steps

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

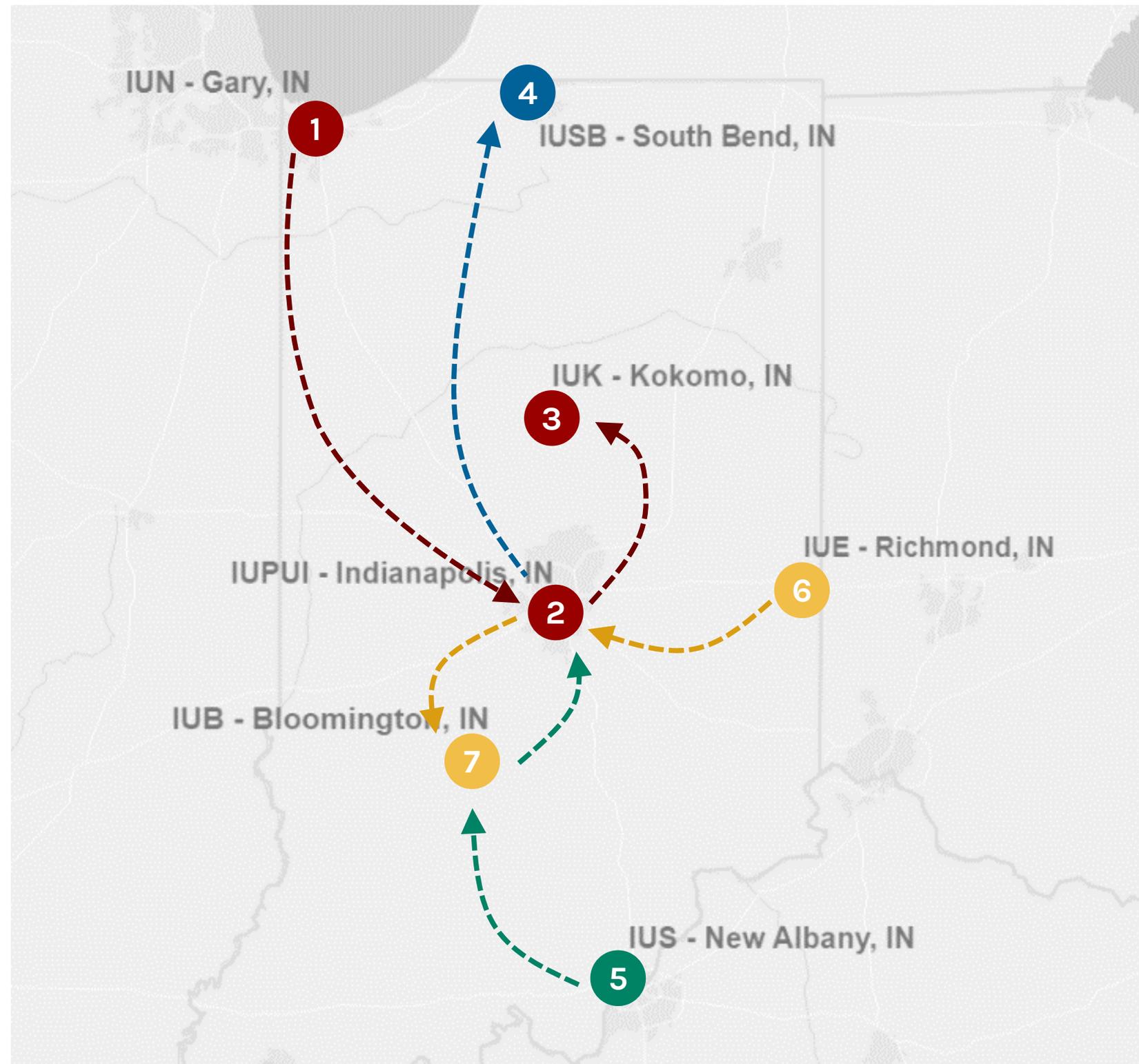
Date	Campus	Forum #	Event
October 11	IUPUI		Committee Meeting
October 12	IUSB	4	Public Forum #4 + IUSB Campus Tour

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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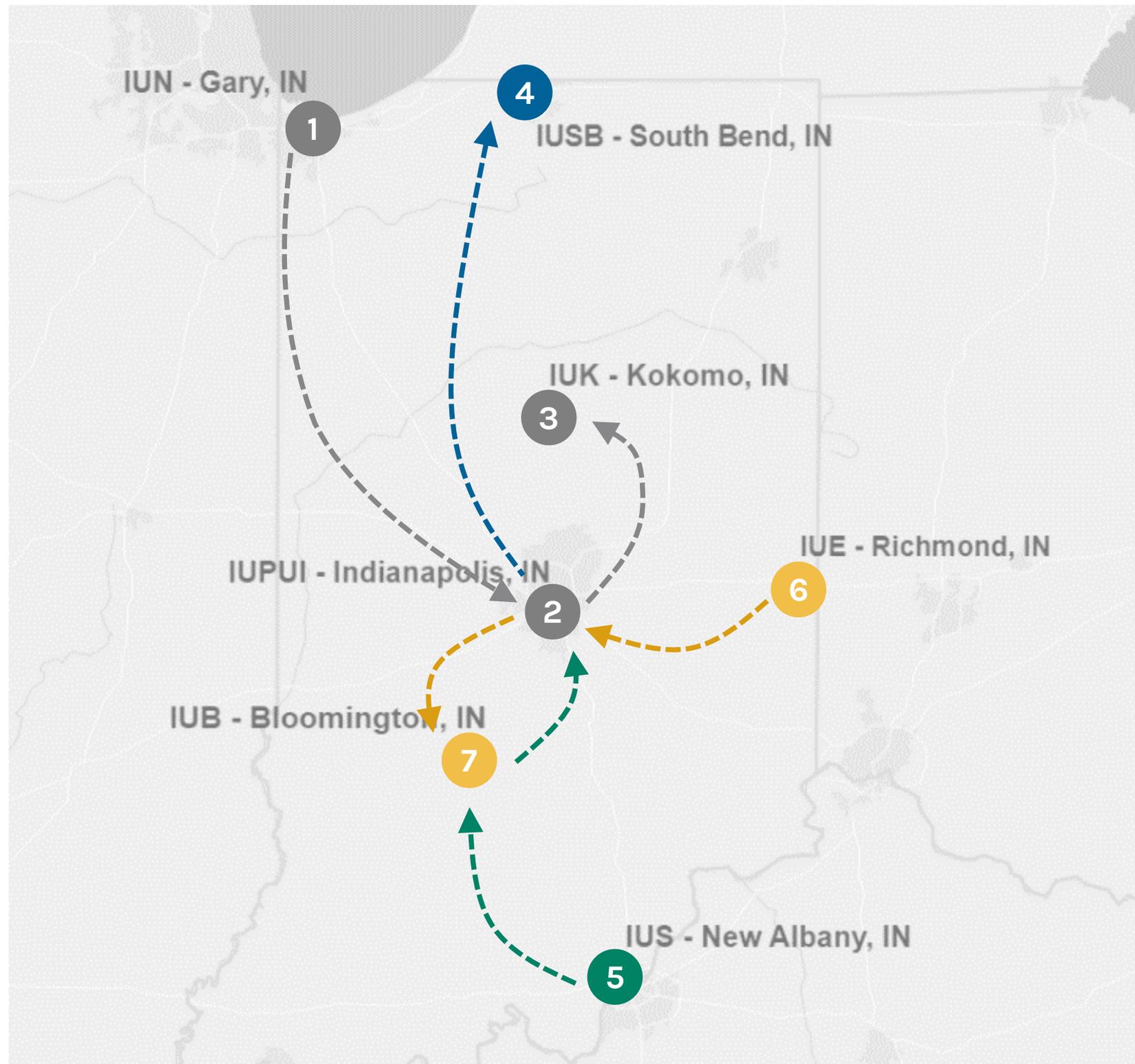
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PUBLIC FORUM PURPOSE & OBJECTIVES

SESSION OVERVIEW

SESSION PURPOSE:

Kick-off the Indiana University Climate Action Plan by sharing process and approach and seeking in put to develop a shared direction for the opportunities and goals of the plan.

SESSION OBJECTIVES:

- Introduce Indiana University Climate Action Planning staff & committee and SmithGroup
- Provide overview of project scope, approach, and planning process
- Review initial project goals, previous / current Indiana University initiatives
- Request input on priorities regarding topics such as climate change, energy use, and prioritization
- Engage in activities aimed at framing a future vision for the Indiana University Climate Action Plan



STARS REPORTING

WHAT IS STARS?

“The Sustainability Tracking, Assessment & Rating System (STARS) is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance.”



Source: About STARS

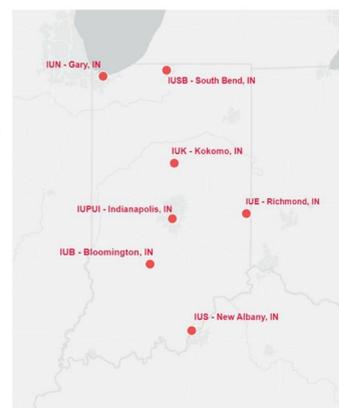
AN OVERVIEW OF STARS RATING CATEGORIES

Category	Topics
Academics	Curriculum Research
Operations	Air & Climate
	Buildings
	Energy
	Food & Dining
	Grounds
Engagement	Purchasing
	Transportation
	Waste
	Water
Planning & Administration	Campus Engagement
	Public Engagement
	Coordination & Planning
Innovation & Leadership	Diversity & Affordability
	Investment & Finance
	Wellbeing & Work
	Exemplary Practice
	Innovation

STARS REPORTING

Indiana University STARS Reporting

IU CAMPUS	RATING	FUTURE RATING
IU Bloomington	Gold	Platinum
IU South Bend	Bronze	Platinum
IUPUI	Gold	Platinum
IU Southeast	Silver	Platinum
IU East	Not yet reporting	Platinum
IU Kokomo	Not yet reporting	Platinum
IU North	Not yet reporting	Platinum



WHAT DO WE MEAN BY CARBON NEUTRALITY?

Indiana University has set a target for carbon neutrality by 2040.

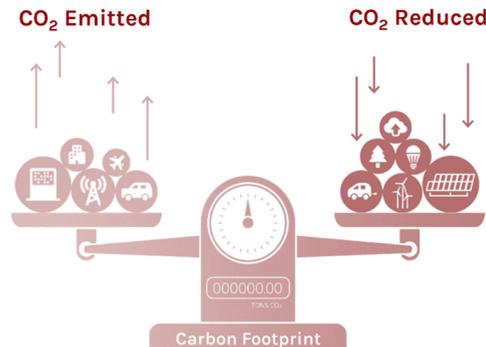
But what does this mean?

	CARBON NEUTRALITY	NET-ZERO EMISSIONS
Definition	Reduces carbon emissions and balances remaining emissions	Pertains to all Greenhouse Gases (GHG)
Emission Types	Scopes 1 & 2 (Scope 3 is optional)	Scopes 1, 2, & 3
Typical Application	Institution, company, or product	Global, national, state, community, institution, or company

WHAT WILL BE MEASURING?

Based on historic trends, current state, and future projections, we will be measuring:

- Energy Use
- Energy Use Intensity (EUI)
- Greenhouse Gas (GHG) emissions



UNDERSTANDING GHG EMISSIONS

SCOPE 1 EMISSIONS

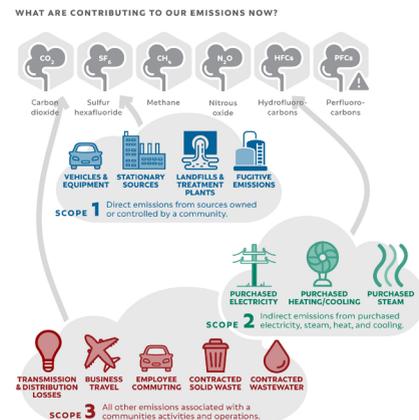
Direct emissions from fuel burned in owned or controlled assets including buildings, vehicles, and equipment.

SCOPE 2 EMISSIONS

Indirect emissions from purchased electricity, steam, heat, and cooling.

SCOPE 3 EMISSIONS

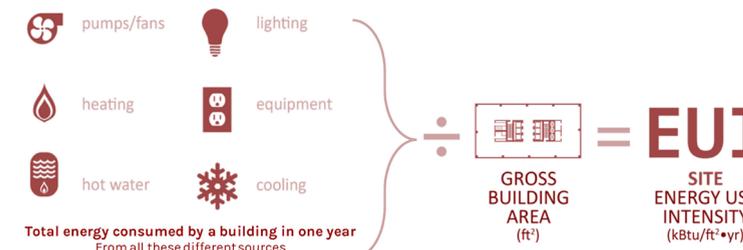
All other indirect emissions the result of activities from assets not owned or controlled by Indiana University, but that the university indirectly impacts in its value chain.



Source: Diagram based on Greenhouse Gases Diagram from EPA

MEASURING ENERGY USE INTENSITY

HOW DO WE CALCULATE EUI?
And why is that important?



Definition adapted from AIA California

ABOUT ENERGY USE INTENSITY (EUI)

EUI CAN BE USED TO:

Set a target for energy performance of new or retrofitted buildings

Benchmark building performance against others of the same building type

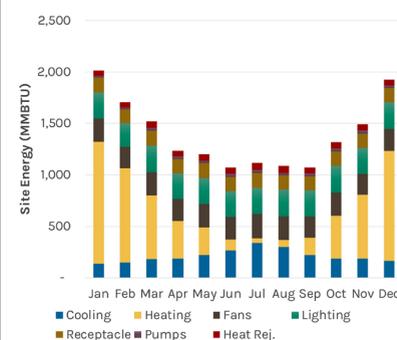
Reporting & Tracking compliance against energy code requirements

Energy use intensity (EUI) is an indicator of the energy efficiency of a building's design and operations.

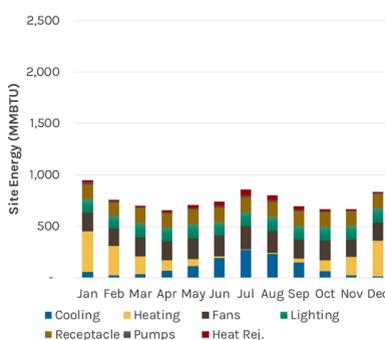
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ENERGY MODELING

Energy usage before reduction strategies



Energy usage after reduction strategies



A 2030 PLAN TO SUPPORT A 2040 VISION



STARS REPORTING

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Academics	Curriculum Research
Operations	Air & Climate Buildings Energy Food & Dining Grounds Purchasing Transportation Waste Water
Engagement	Campus Engagement Public Engagement
Planning & Administration	Coordination & Planning Diversity & Affordability Investment & Finance Wellbeing & Work
Innovation & Leadership	Exemplary Practice Innovation

Source: About STARS

Helpful context for project

STARS REPORTING

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Confusing or misleading

WHAT DO WE MEAN BY CARBON NEUTRALITY?

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But what does this mean?

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Helps define scope of IU CAP

Confusing

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CO₂ Emitted vs CO₂ Reduced

Carbon Footprint

Helps define scope of IU CAP

UNDERSTANDING GHG EMISSIONS

WHAT ARE CONTRIBUTING TO OUR EMISSIONS NOW?

SCOPE 1 EMISSIONS: Direct emissions from fuel burned in owned or controlled assets including buildings, vehicles, and equipment.

SCOPE 2 EMISSIONS: Indirect emissions from purchased electricity, steam, heat, and cooling.

SCOPE 3 EMISSIONS: All other indirect emissions the result of activities from assets not owned or controlled by Indiana University, but that the university indirectly impacts in its value chain.

Difficult to read

MEASURING ENERGY USE INTENSITY

HOW DO WE CALCULATE EUI? And why is that important?

Total energy consumed by a building in one year from all these sources

GROSS BUILDING AREA (ft²) = EUI

SITE ENERGY USE INTENSITY (kBtu/ft²•yr)

Too much detail (this will put people to sleep)

ABOUT ENERGY USE INTENSITY (EUI)

EUI CAN BE USED TO:

- Set a target for energy performance of new or retrofitted buildings
- Benchmark building performance against others of the same building type
- Reporting & Tracking compliance against energy code requirements

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Too much detail

ENERGY MODELING

Energy usage before reduction strategies vs Energy usage after reduction strategies

Site Energy (MMBtu)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

■ Cooling ■ Heating ■ Fans ■ Lighting ■ Receptacle ■ Pumps ■ Heat Rej.

Illustrative of final deliverable

A 2030 PLAN TO SUPPORT A 2040 VISION

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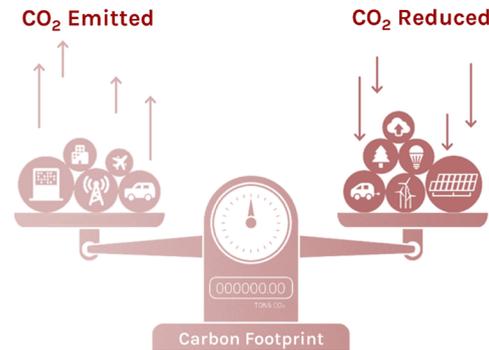
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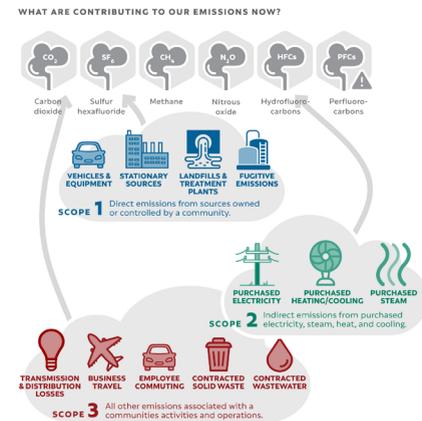
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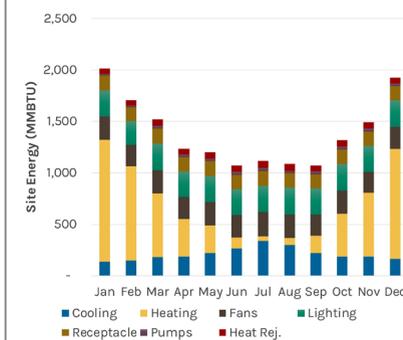
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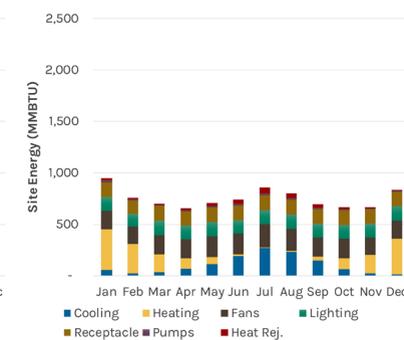
Source: Diagram based on Greenhouse Gases Diagram from EPA

ENERGY MODELING

Energy usage before reduction strategies



Energy usage after reduction strategies



A 2030 PLAN TO SUPPORT A 2040 VISION

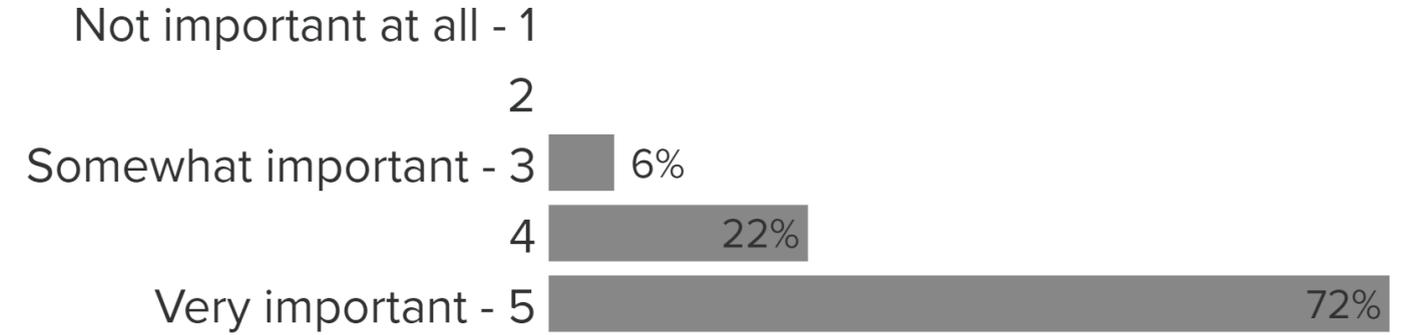


SURVEY QUESTIONS

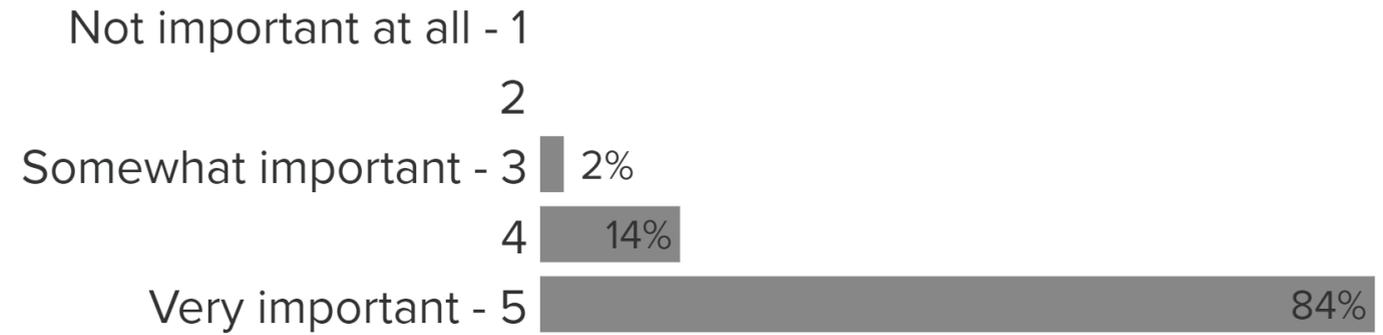
COMPARING INPUT

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

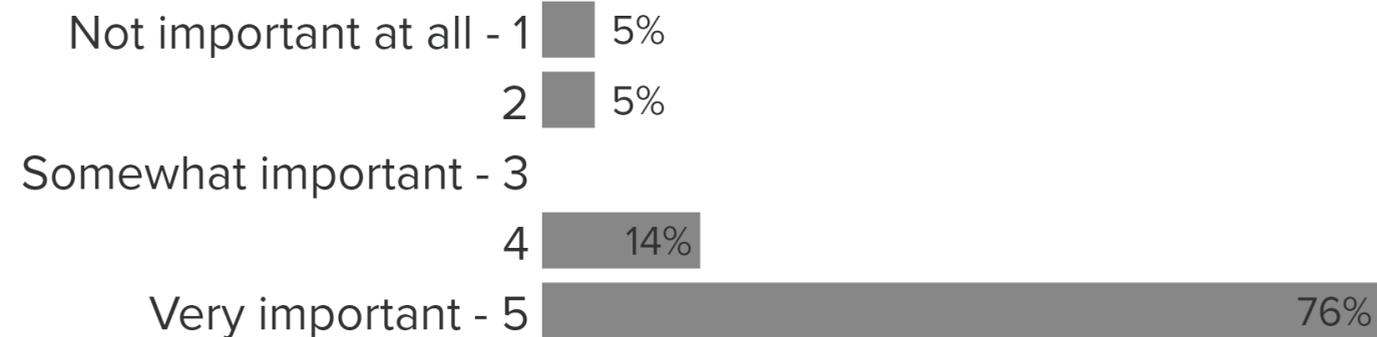
IUN - GARY



IUPUI - INDIANAPOLIS



IUK - KOKOMO

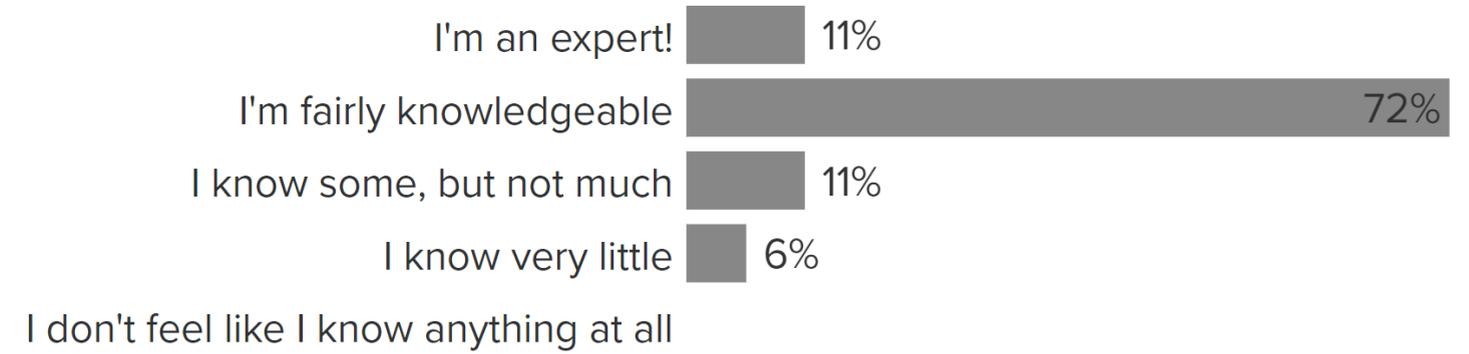


SURVEY QUESTIONS

COMPARING INPUT

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

IUN - GARY



IUPUI - INDIANAPOLIS



IUK - KOKOMO

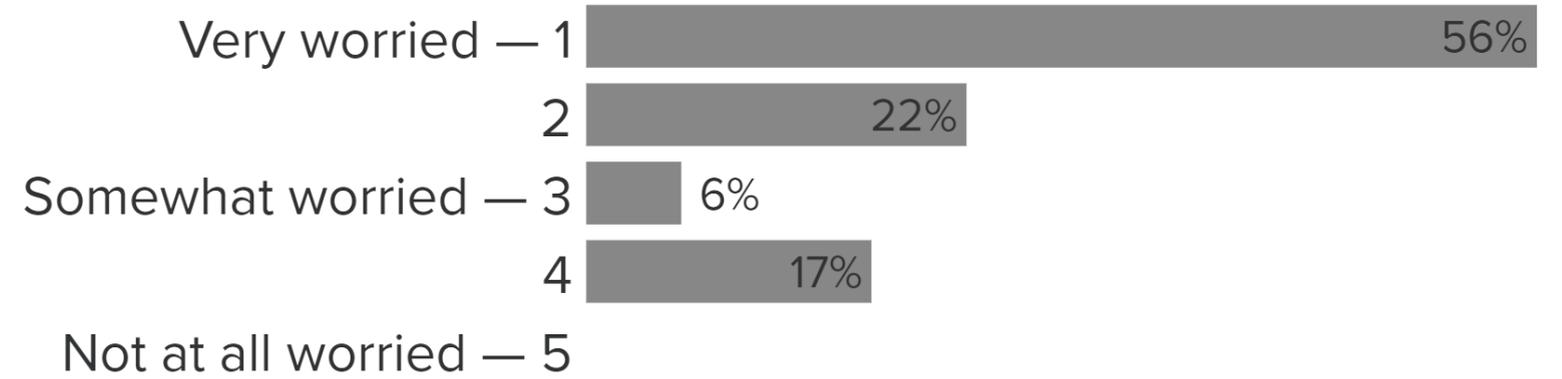


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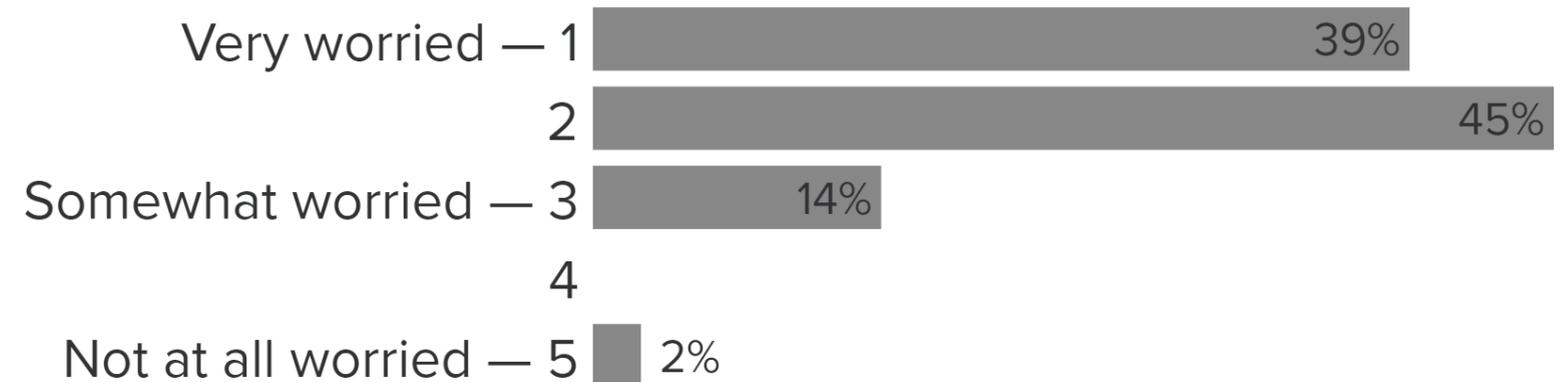
COMPARING INPUT

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

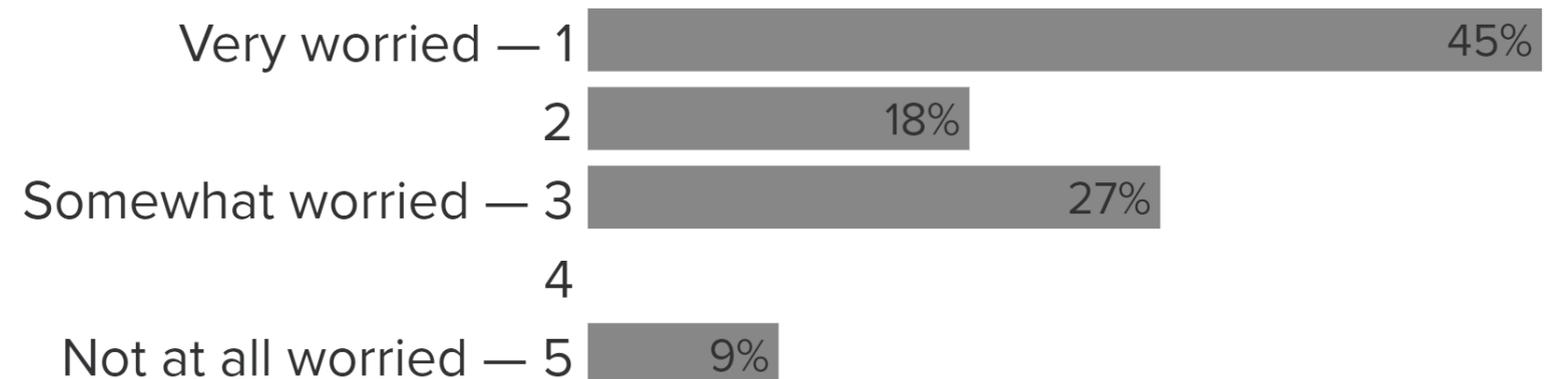
IUN - GARY



IUPUI - INDIANAPOLIS



IUK - KOKOMO



WHAT ARE YOU DOING TODAY?

PUBLIC FORUM INPUT QUESTIONS

IU NORTHWEST TODAY

- LED - 92% lights + Projectors
- SMART SENSORS - lighting
- Tree Planting
- Reduction of trash linings
- Update HVAC Eq.
- Window Replacement
- Shut off timers for comp + equip.
- Intro EV'S - Univ. fleet.
- Charging Stations
- Upgrade Boilers
- Building meters independent
- System wide LEED stds.
- On-line Course offerings vs. in-person
- Water Conservation - shut-off timers.
- Centralized Purchasing

- Bus Service
- Scheduling for demand load
- Community garden
- Reduce impervious.
- No mow zones.
- Env. friendly chemicals
- Native Plantings - Prairie.
- Air Monitoring station
- Building Community Partnerships
 - SCA
 - City of Gary
 - CURE.

IUN - GARY

HOW IS IUPUI REDUCING OUR CARBON EMISSIONS TODAY?

MOBILITY	SYSTEMS	SITE
<ul style="list-style-type: none"> RIDE THE BUS ALWAYS BIKE E-bike charging in garages. Walking (walkable campus) Pool Share (carpool) services EV charging and parking program. Biking inside the campus. Bike lanes and good connections. Campus clinic connecting to Red Line. 	<ul style="list-style-type: none"> University Fleet electrifying Indianapolis Cultural Trail (N-S) Promoting Jogging + Carpooling White coats on campus buildings. (leave near cloud effects). Lighting upgrades in parking garages. Solar Panels. (Cascadia buildings) Renov. (commissioning Existing Building) Timed lights in dorm rooms LEED standards for new construction and renovation. 	<ul style="list-style-type: none"> Temperature Setpoints. Low-flush Toilets. White coats on campus buildings. (leave near cloud effects). Lighting upgrades in parking garages. Solar Panels. (Cascadia buildings) Renov. (commissioning Existing Building) Timed lights in dorm rooms LEED standards for new construction and renovation.

IUPUI - INDIANAPOLIS

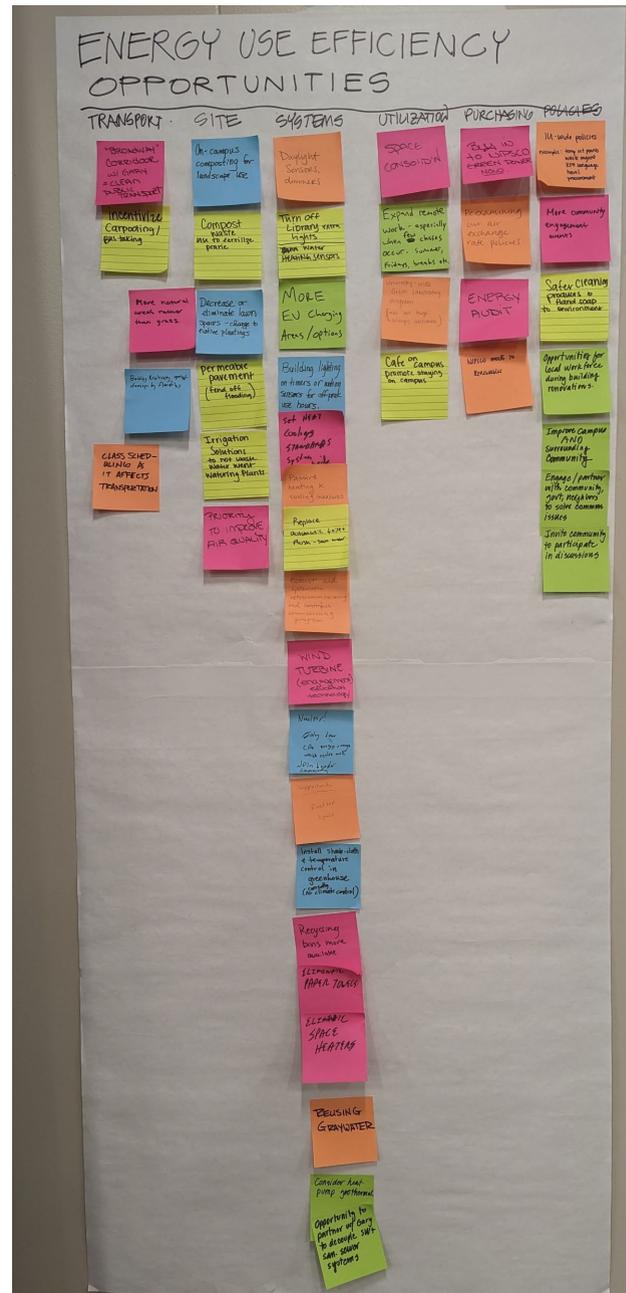
HOW IS IU KOKOMO REDUCING CARBON EMISSIONS TODAY?

- WALKING TO SCHOOL
- CARPPOOLING (SELF-ORGANIZED)
- VIRTUAL LEARNING
- HYBRID CARS + SOME EVS
- PLANT TREES ON CAMPUS (2X/YEAR)
- STUDENT SUSTAINABILITY COUNCIL + PARTNERSHIP w/ OFFICE OF SUSTAINABILITY FOR INITIATIVES
- PUBLIC TRANSPORTATION
- COMPOSTABLE UTENSILS
- REDUCING AMT. OF MEAT + RED MEAT EATEN (NEED MORE OPTIONS)
- LIGHT OCCUPANCY SENSORS
- PUSHING FOR RECYCLING
- NOT HAVING KIDS

IUK - KOKOMO

WHAT ARE SOME OPPORTUNITIES TO REDUCE CARBON EMISSIONS?

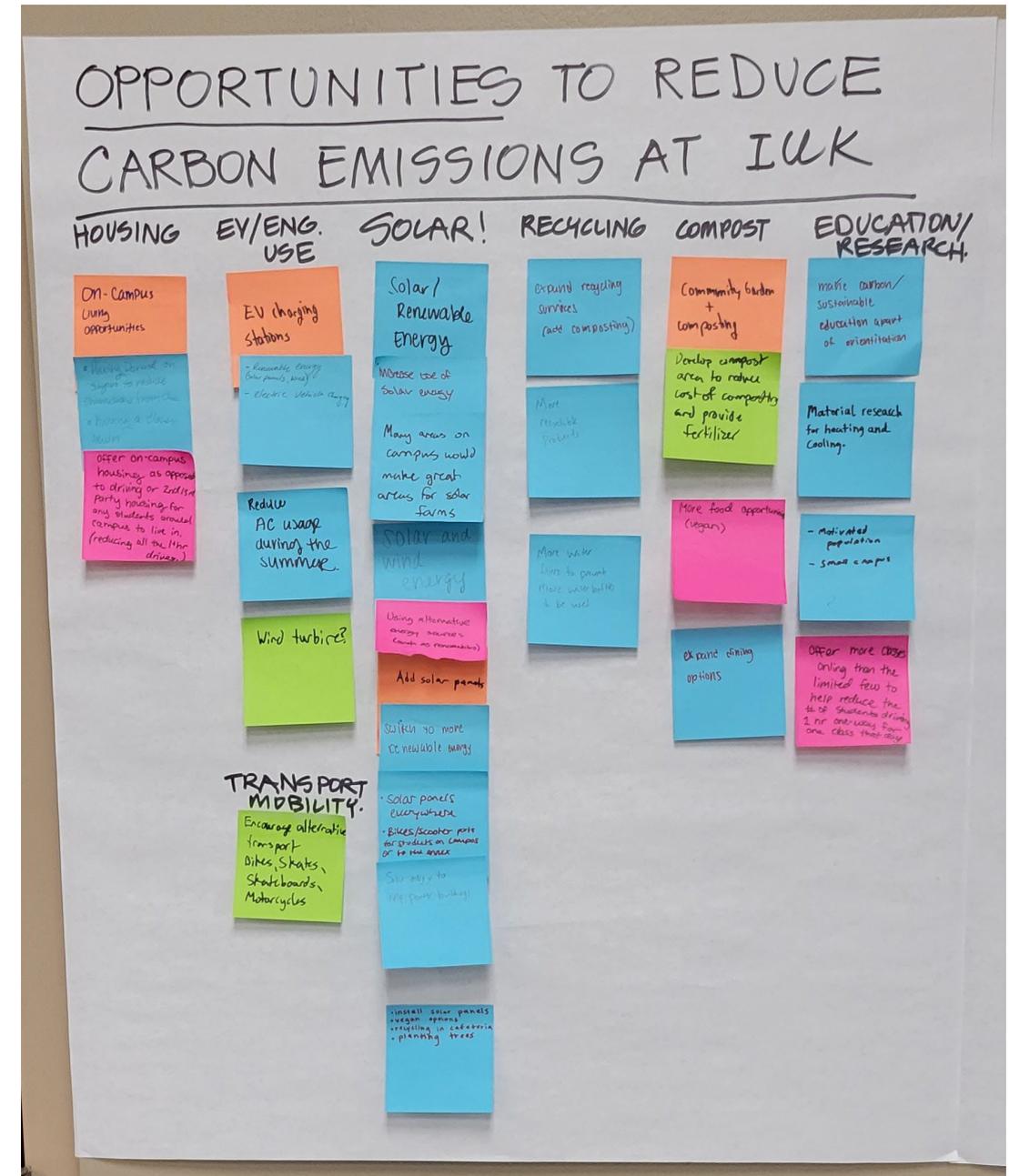
PUBLIC FORUM INPUT QUESTIONS



IUN - GARY



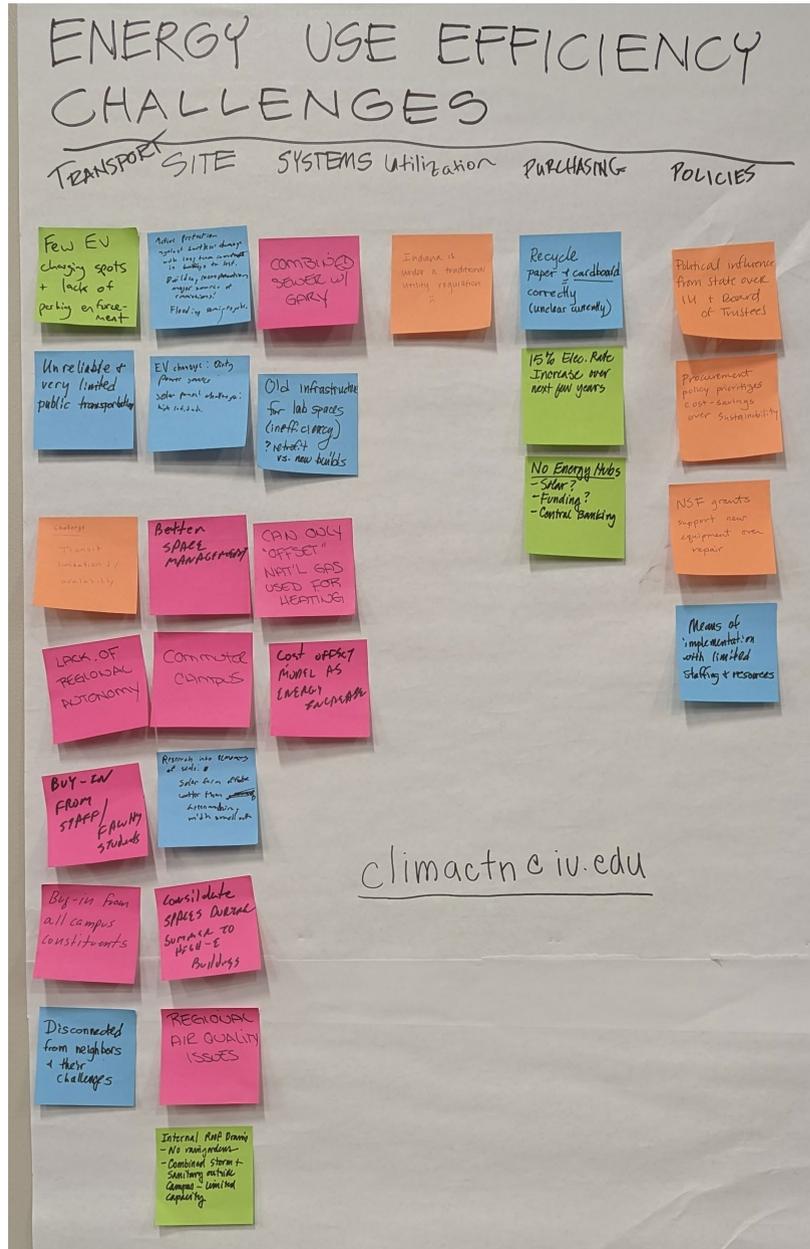
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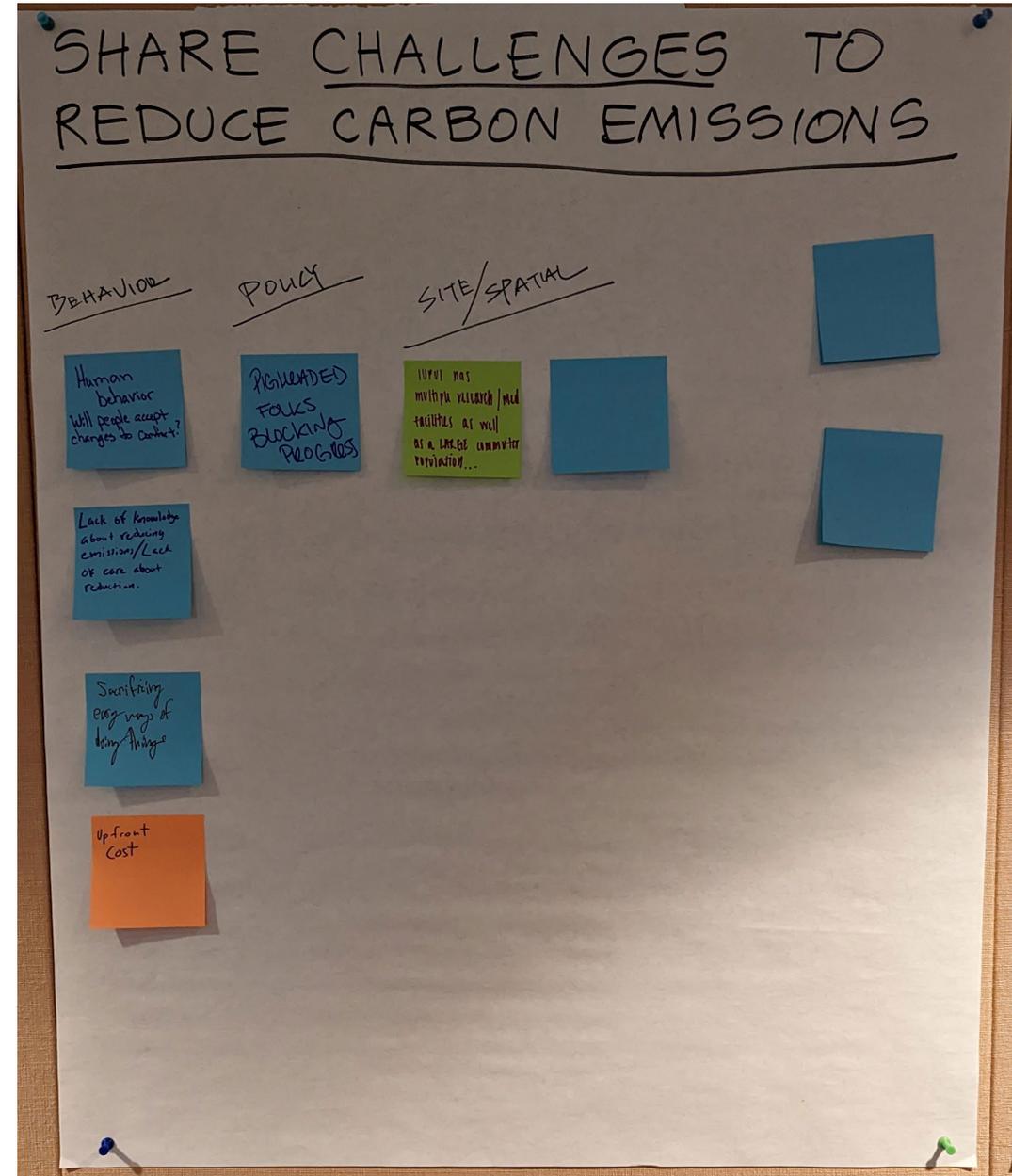
IUK - KOKOMO

WHAT ARE SOME **CHALLENGES** TO REDUCING CARBON EMISSIONS?

PUBLIC FORUM INPUT QUESTIONS



IUN - GARY



IUPUI - INDIANAPOLIS



IUK - KOKOMO

OPPORTUNITIES

COMMON THEMES

Consistent focus on renewable energy generation

- Solar
- Wind
- Heat pumps

• Solar panels everywhere

• Bikes/scooter parts for students on campus or to the annex

Add solar panels

Wind turbine?

Using alternative energy sources (such as renewables)

Increase use of solar energy

- Renewable energy (solar panels, wind)

- electric vehicle charging

Solar and wind energy

Consider heat-pump geothermal

Switch to more renewable energy

Solar / Renewable Energy

WIND TURBINE (engagement) education technology

Many areas on campus would make great areas for solar farms

OPPORTUNITIES

COMMON THEMES

- Renewable energy generation
- Mobility & transportation
- Site, buildings & facilities
- Systems
- Operations & utilization
- Purchasing
- Policies
- Social (people-based solutions, education, research, community, partnerships)
- Smart metering & fixtures
- Passive energy efficiency & design
- Food & waste

Building lighting
on timers or motion
sensors for off-peak
use hours.

Daylight
Sensors,
dimmers

Install shade-cloth
& temperature
control in
greenhouse
(currently
no climate control)

Encourage alternative
transport
Bikes, Skates,
Skateboards,
Motorcycles

Passive
heating &
cooling measures

- Motivated
population
- Small campus

CHALLENGES

COMMON THEMES

- Costs & Funding
- Capacity (staff, time)
- Mobility & Transportation
- Site, buildings & facilities
- Systems
- Operations & utilization
- Purchasing
- Policies
- Social (education, engagement, behavior, culture, perception)
- Technology
- Outside factors

Human behavior
Will people accept changes to comfort?

Means of implementation
with limited staffing & resources

Not everyone embraces the need for climate ~~action~~ action, how do we get everyone on board?

Political influence from state over IU + Board of Trustees

Funding

Lack of Technology/Time to implement Carbon emission Reduction

15% Elec. Rate Increase over next few years

Building green energy alternatives would reduce the appearance of the campus reducing enrollment

Cost of restoration

wind energy is costly, noisy, and need a lot of space

Buy-in from all campus constituents

Cost

COMMITTEE GOAL AND GUIDING PRINCIPLES

PURPOSE OF THE COMMITTEE

Develop recommendations for short- and long-term opportunities to **reduce greenhouse gas emissions** on all IU campuses

GUIDING PRINCIPLES

- Complete, comprehensive and scientifically sound
- Immediate implementation where possible
- Financial resources required
- Funding sources and savings identified
- Broad input from students, faculty and staff on all campuses
- Benchmarks, dashboards and transparency of process and progress
- **Carbon neutrality by 2040**

QUESTIONS

AUDIENCE Q&A

- Will the IU Board of Trustees have to approve the climate action plan? What happens if they don't?
- What is the plan after April 2023? Will you continue to work on other areas of emissions?
- IUPUI has around a 60% commuter population, what are your ideas to account for the carbon emissions from student transportation to campus?
- If only a small group wanted to make a climate action plan where is a good place to start/what topics or fields would they be the most effective?
- How do you join the sustainability council?
- What are some of your ideas on increasing student participation in these plans? Other than open forums and surveys?
- How will you address sustainability and efficiency when it comes to the medical buildings in campus?
- Is the university willing to actually invest in the solutions needed for carbon neutrality?
- Will this process yield a climate action plan or a list of recommendations?
- How much money does IUPUI allocate to things such as sustainability or climate action in general?
- How are decisions being made regarding return on investment?
- Are you looking at the work that other institutions are doing, and how is that informing this plan?
- Could a future change in administration shift attention away from the IU CAP (and prevent it from being implemented)?
- Are you currently engaging with surrounding communities? Do you plan to as part of this process?
- Will you be focusing on lasting benefits to surrounding communities?
- Campuses have older and aging buildings - will you be focusing more on adaptive reuse of existing buildings or construction of new buildings?



QUESTIONS

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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. 		