

An aerial photograph of the Indiana 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

SMITHGROUP



AGENDA

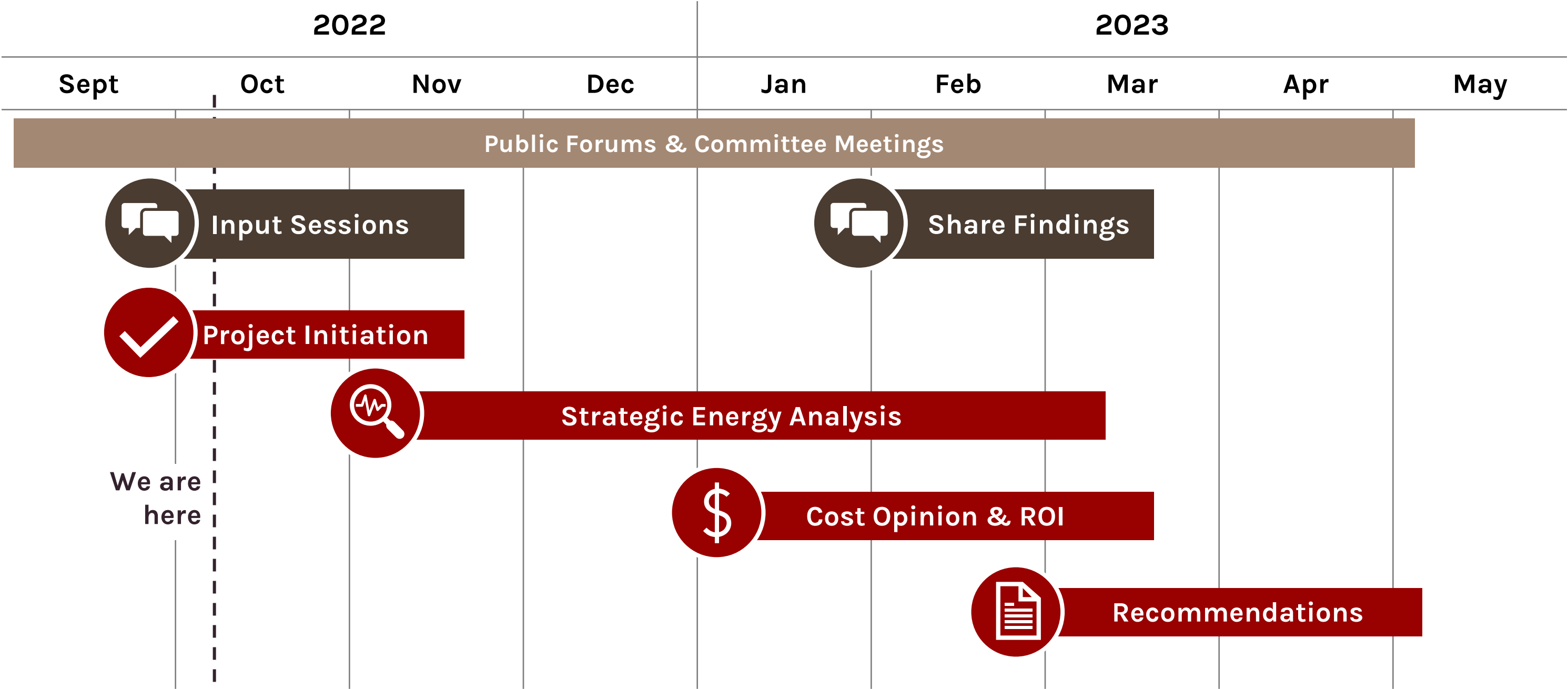
Public Forum Sessions

- 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



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

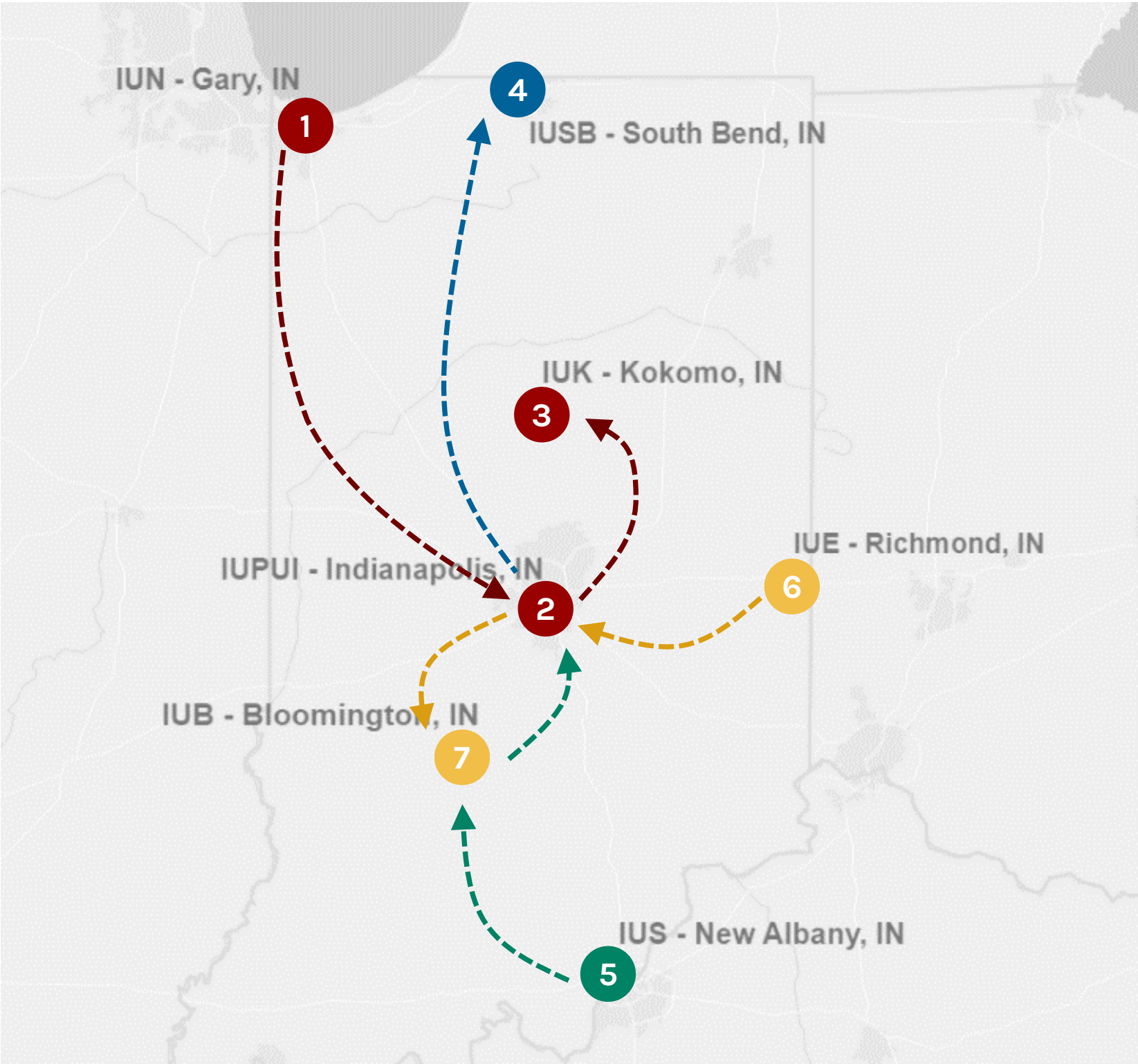
Date	Campus	Forum #	Event
October 11	IUPUI		Committee Meeting
October 12	IUSB	4	Public Forum #4 + IUSB Campus Tour

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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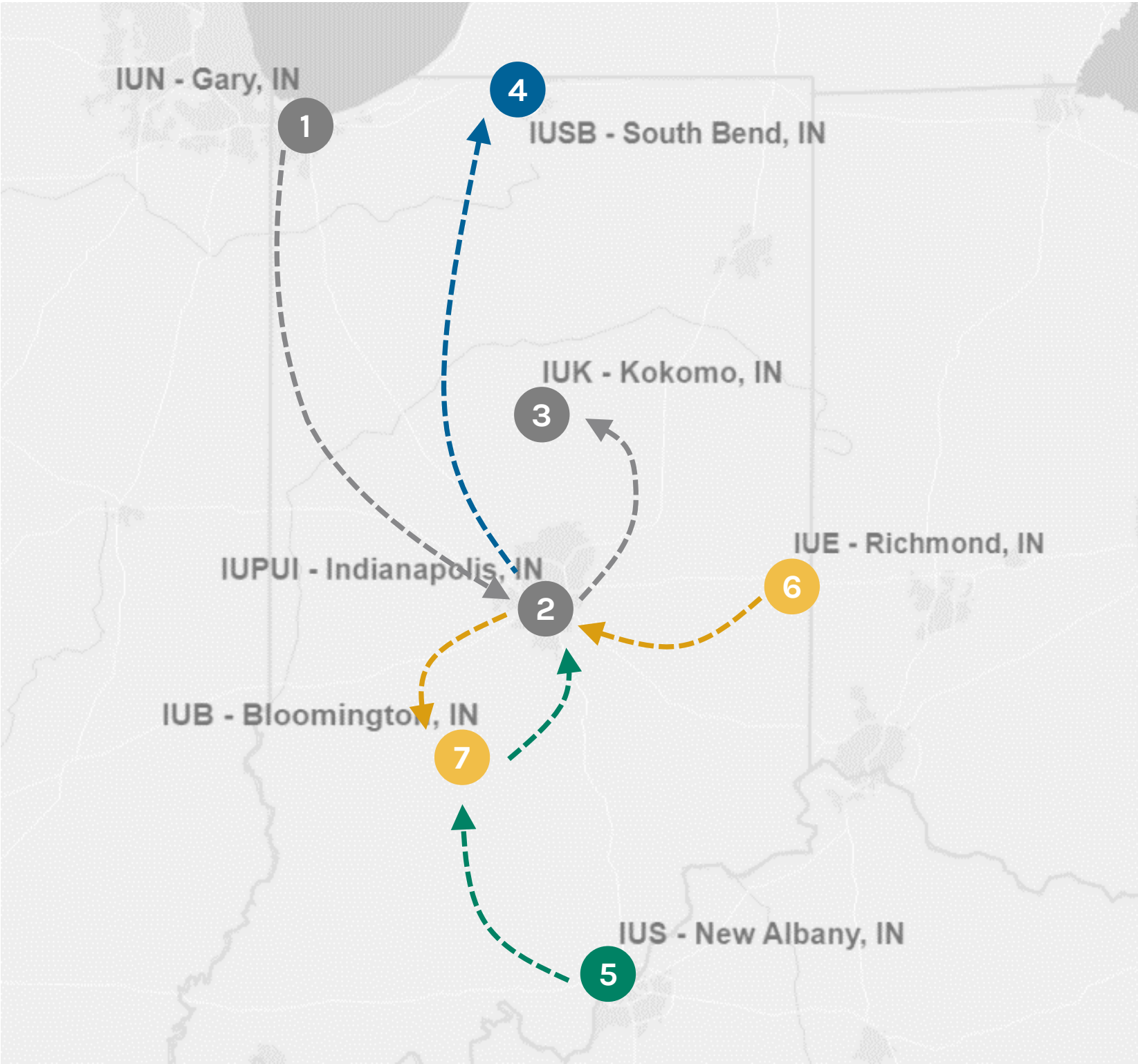
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November 16	IUB	7	Public Forum #7



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](#)

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AN OVERVIEW OF STARS RATING CATEGORIES

Category	Topics
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



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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

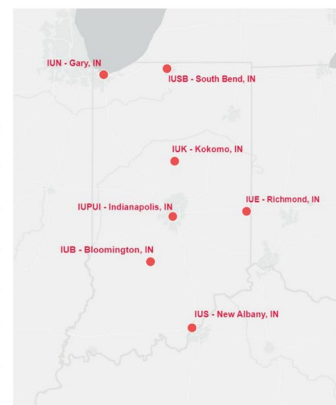
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WHAT DO WE MEAN BY CARBON NEUTRALITY?

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

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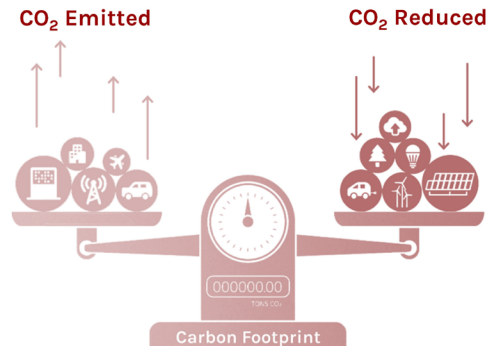
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WHAT WILL BE MEASURING?

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

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



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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 Indiana University, but that the university indirectly impacts in its value chain.

Source: Diagram based on Greenhouse Gases Diagram from EPA

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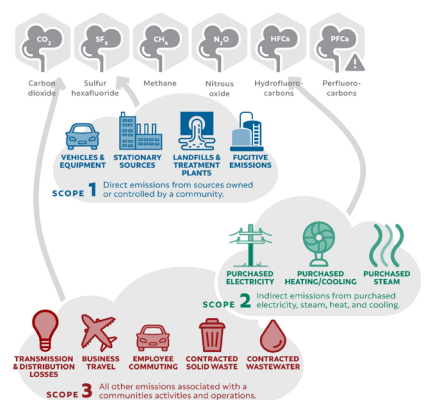
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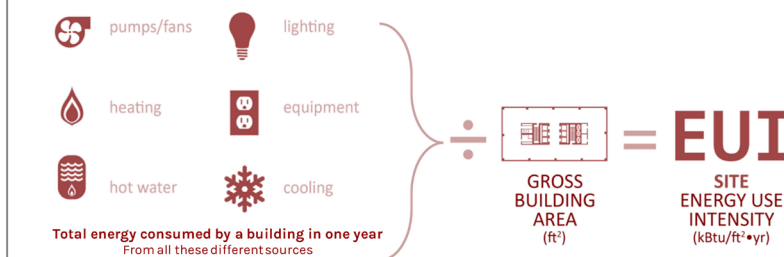
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WHAT ARE CONTRIBUTING TO OUR EMISSIONS NOW?



MEASURING ENERGY USE INTENSITY

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



Definition adapted from AIA California

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ABOUT ENERGY USE INTENSITY (EUI)

EUI CAN BE USED TO:

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



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

Definition adapted from AIA California

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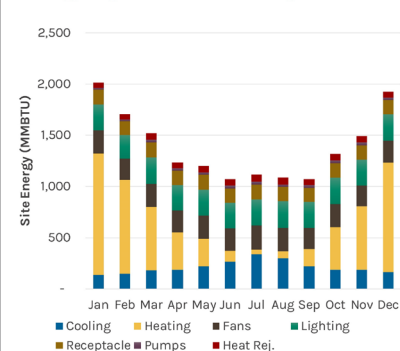


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ENERGY MODELING

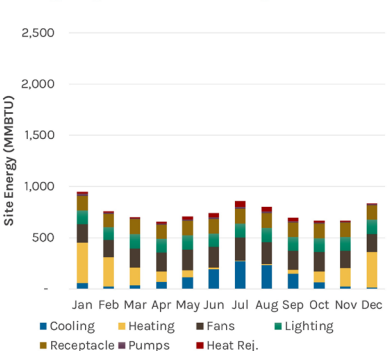
Energy usage before reduction strategies



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Energy usage after reduction strategies



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A 2030 PLAN TO SUPPORT A 2040 VISION



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Helpful context for project

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Confusing or misleading

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Helps define scope of IU CAP

Confusing

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Carbon Footprint

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UNDERSTANDING GHG EMISSIONS

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Too much text

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)

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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
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Too much detail

ENERGY MODELING

Energy usage before reduction strategies

Energy usage after reduction strategies

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Illustrative of final deliverable

A 2030 PLAN TO SUPPORT A 2040 VISION

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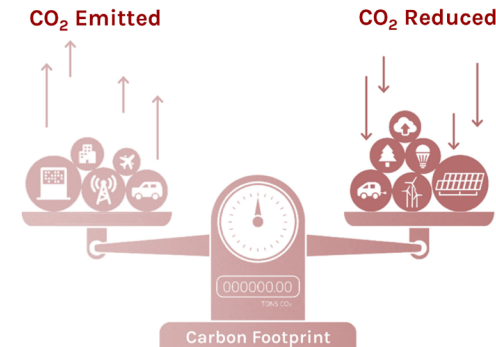
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UNDERSTANDING GHG EMISSIONS

SCOPE 1 EMISSIONS

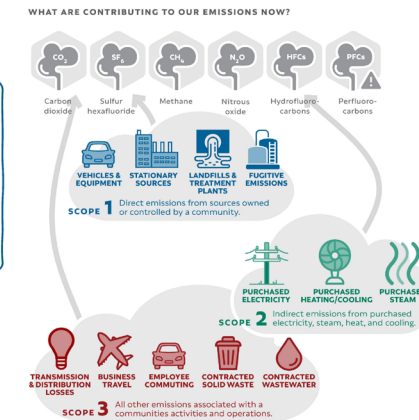
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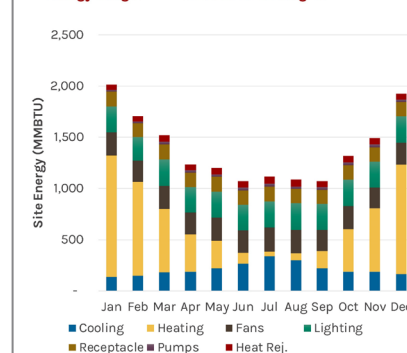
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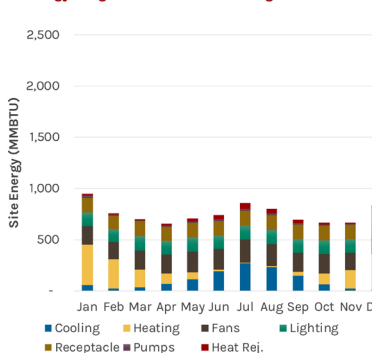
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ENERGY MODELING

Energy usage before reduction strategies



Energy usage after reduction strategies



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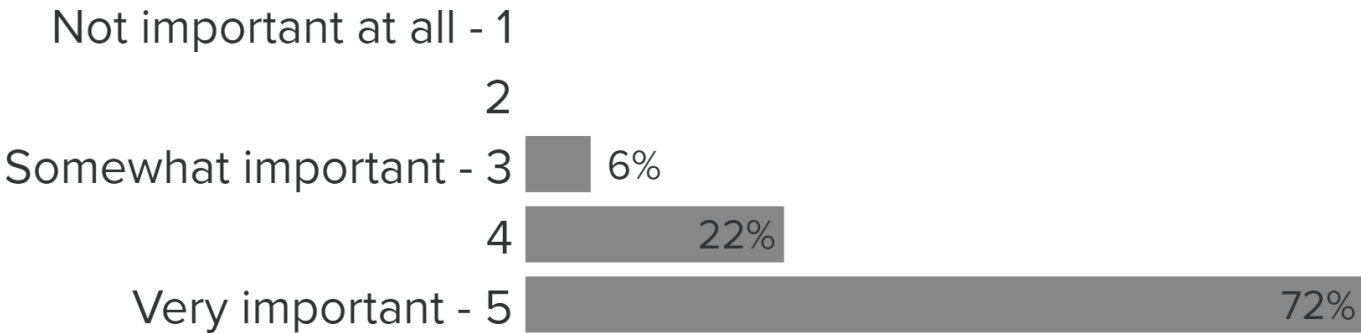


SURVEY QUESTIONS

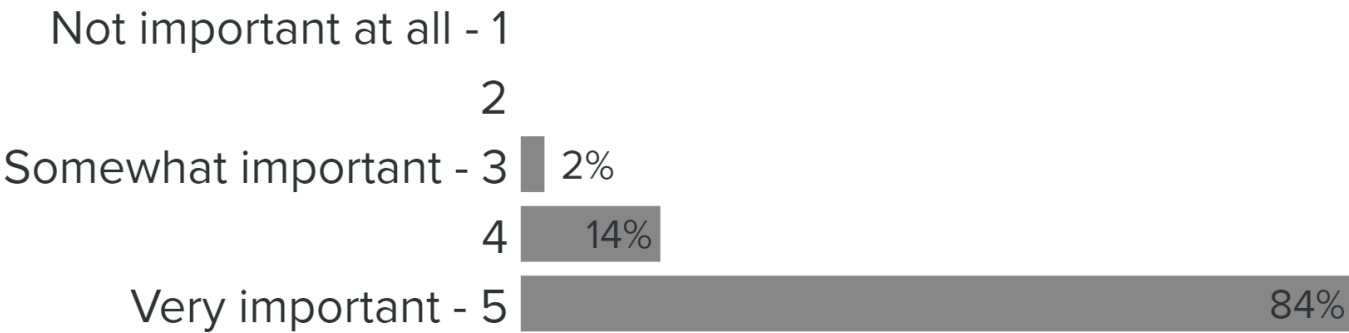
COMPARING INPUT

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

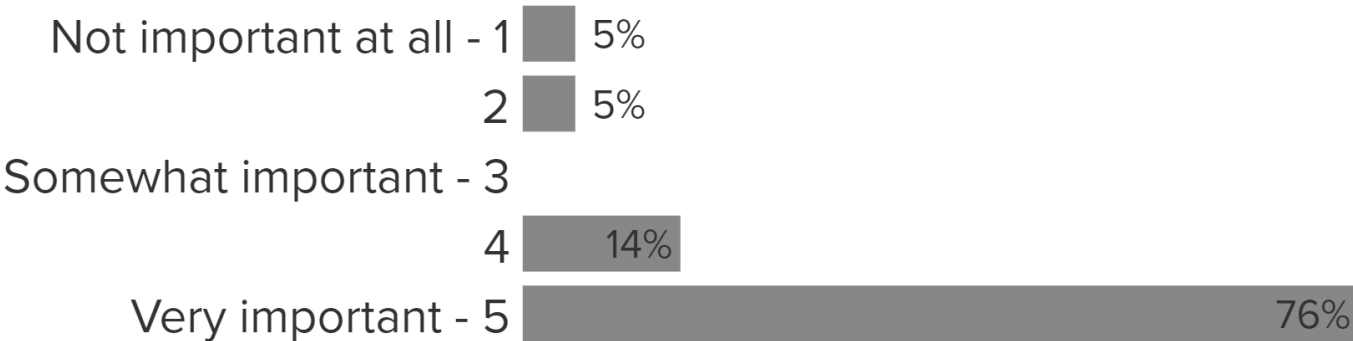
IUN - GARY



IUPUI - INDIANAPOLIS



IUK - KOKOMO

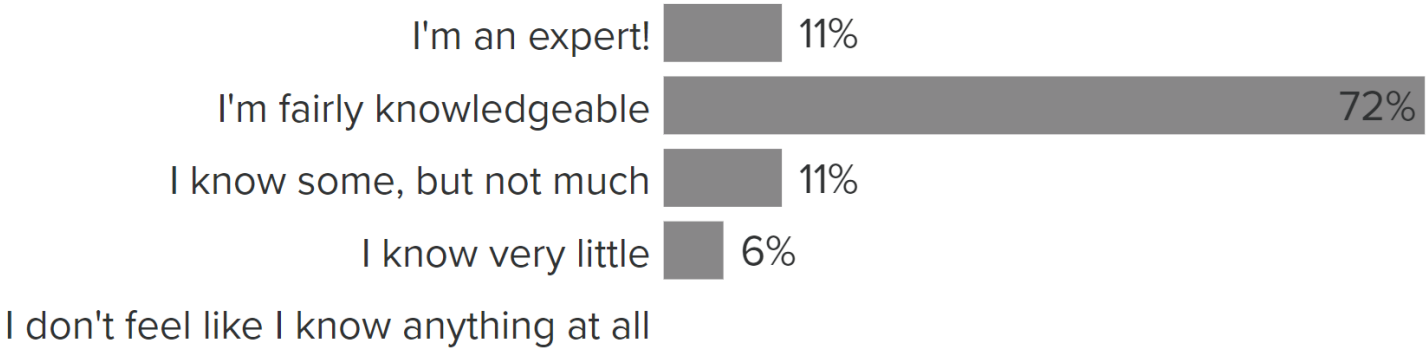


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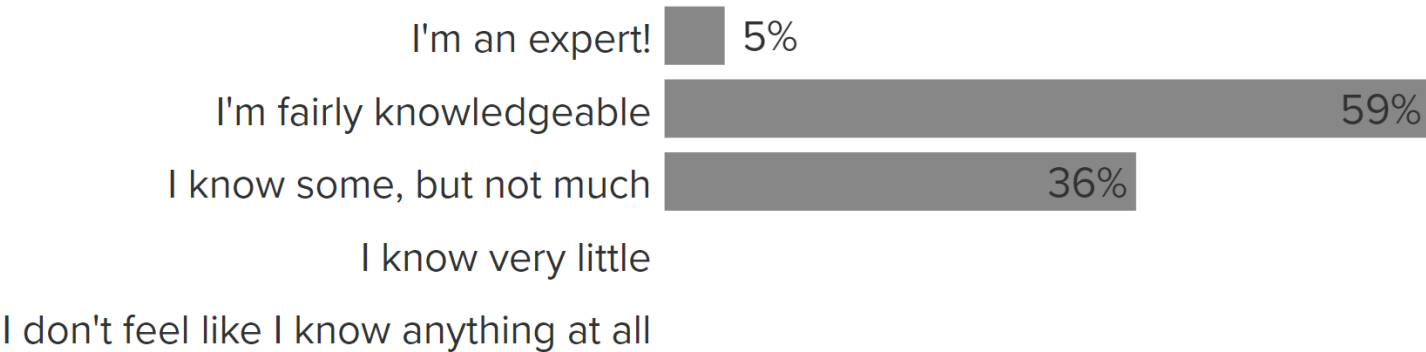
COMPARING INPUT

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

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IUPUI - INDIANAPOLIS



IUK - KOKOMO

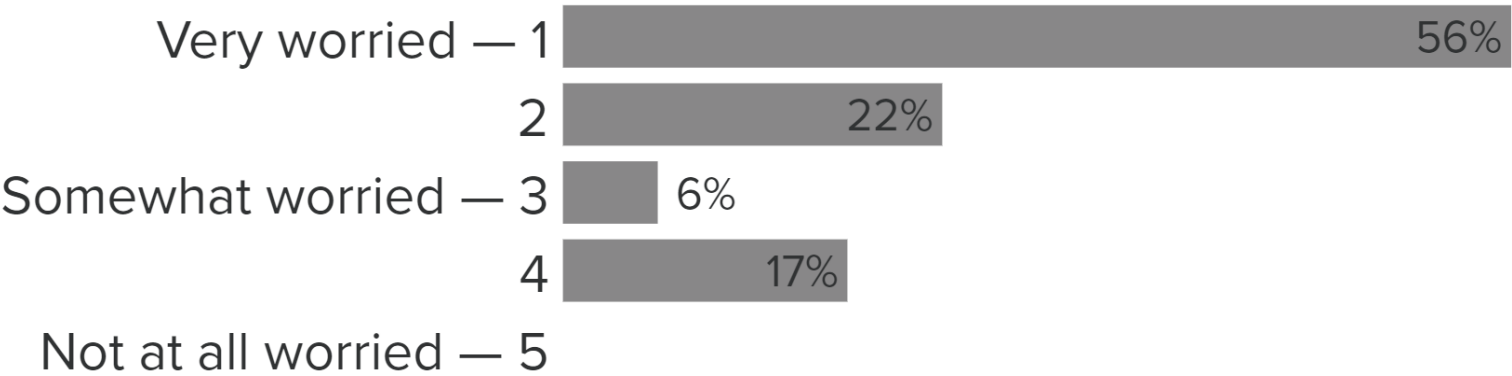


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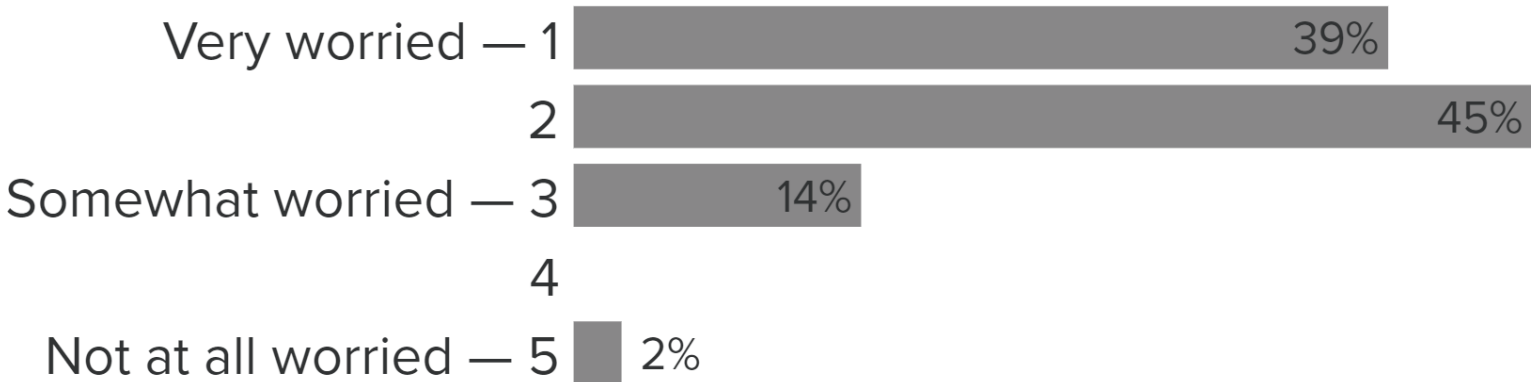
COMPARING INPUT

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

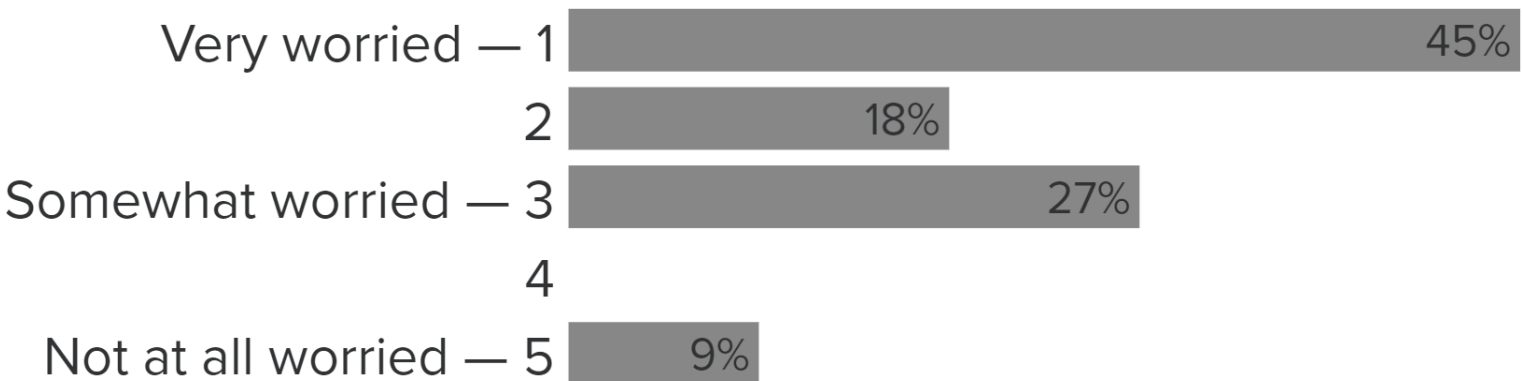
IUN - GARY



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.

HOW IS IUPUI REDUCING OUR CARBON EMISSIONS TODAY?

MOBILITY	SYSTEMS	SITE
Reduce the Bus	Temperature Setpoints.	Electrifying Grounds Equipment.
University Fleet electrifying	Comprehensive Utility Watering (Individual method)	Rain Gardens. Reuse the water.
Indianapolis Cultural Trail (N-S)	Low-Flush Toilets.	Residential Composting.
Promoting Jogging + Carpooling	Sign up for renewable energy programs	
E-bike charging in garages.	White roofs on campus buildings. (active heat island effect).	
Walking (walkable campus)	Lighting upgrades in parking garages.	
Ride Share (carpool) services	Solar Panels. (residence buildings)	
EV charging and parking program.	Relax. (commissioning Existing Building)	
Biking inside the campus. Bike lanes and good connections.	Timed lights in dorm rooms	
Campus clinic connecting to Red Line.	LEED standards for new construction and renovation.	

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

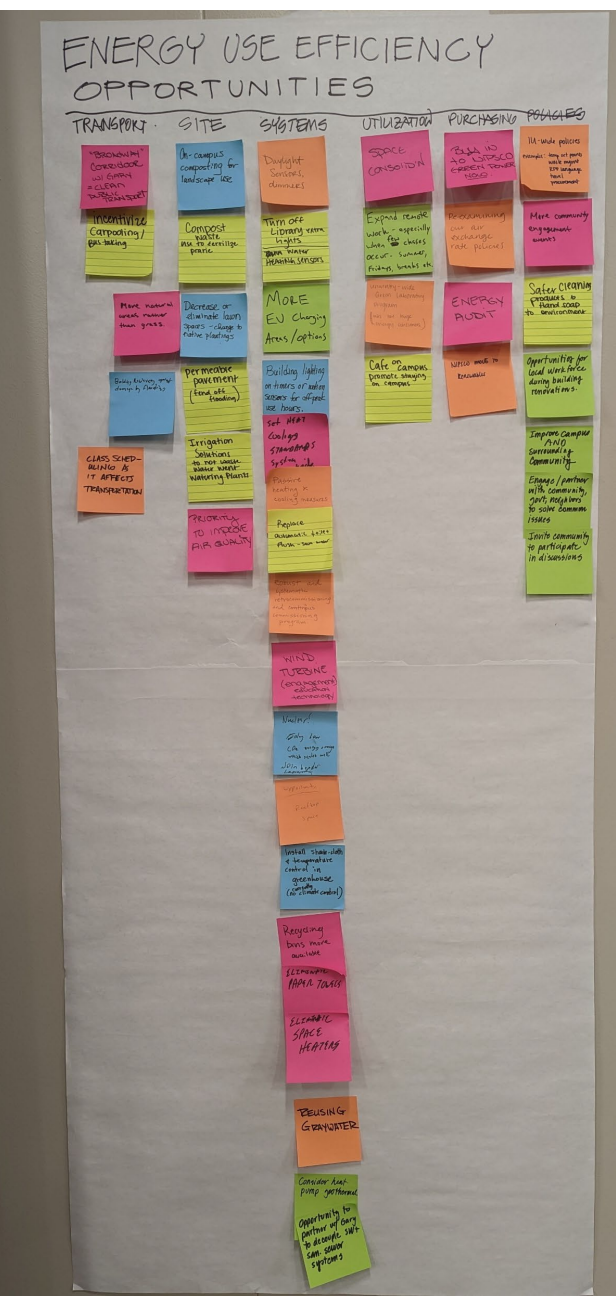
IUN - GARY

IUPUI - INDIANAPOLIS

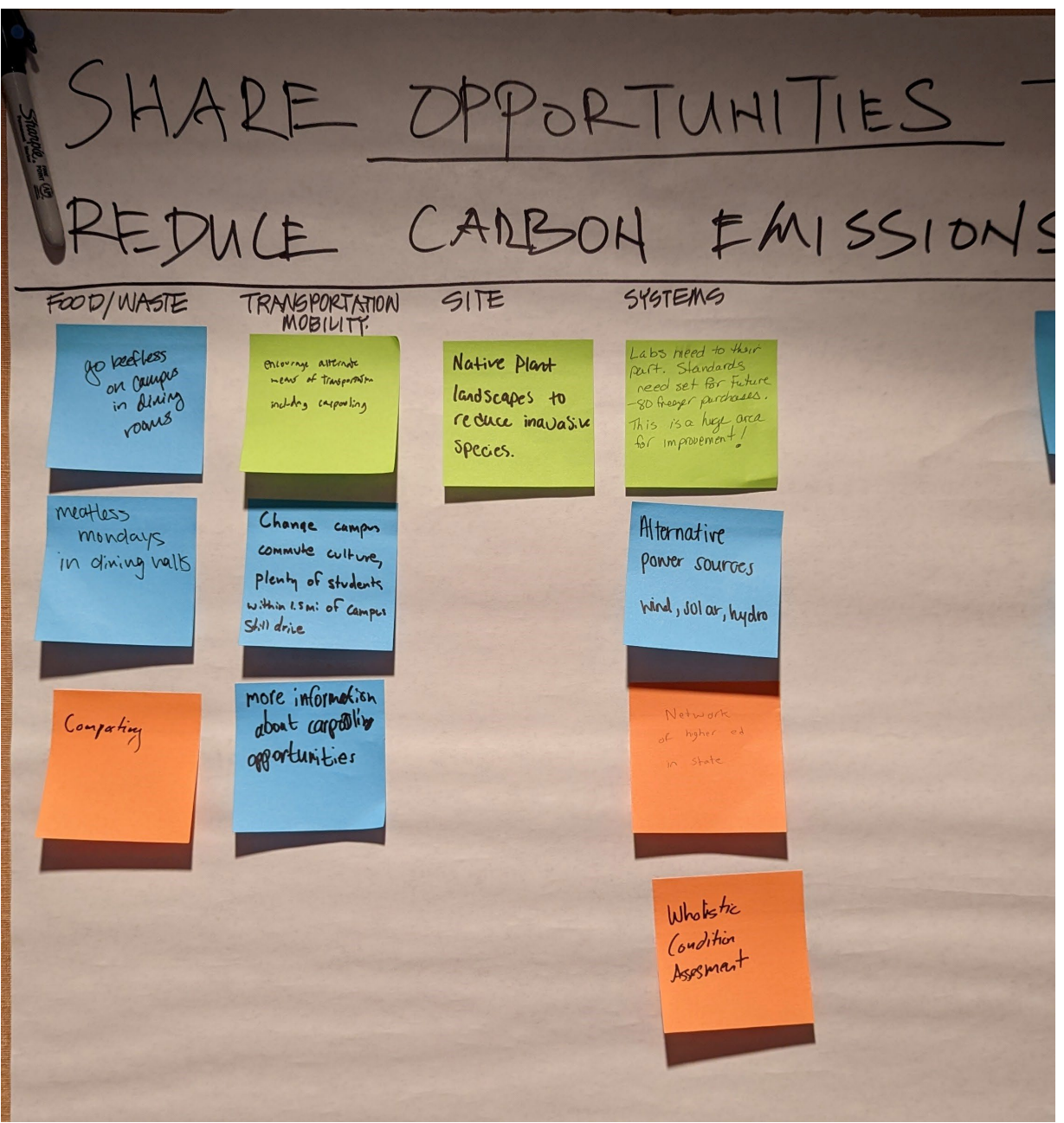
IUK - KOKOMO

WHAT ARE SOME OPPORTUNITIES TO REDUCE CARBON EMISSIONS?

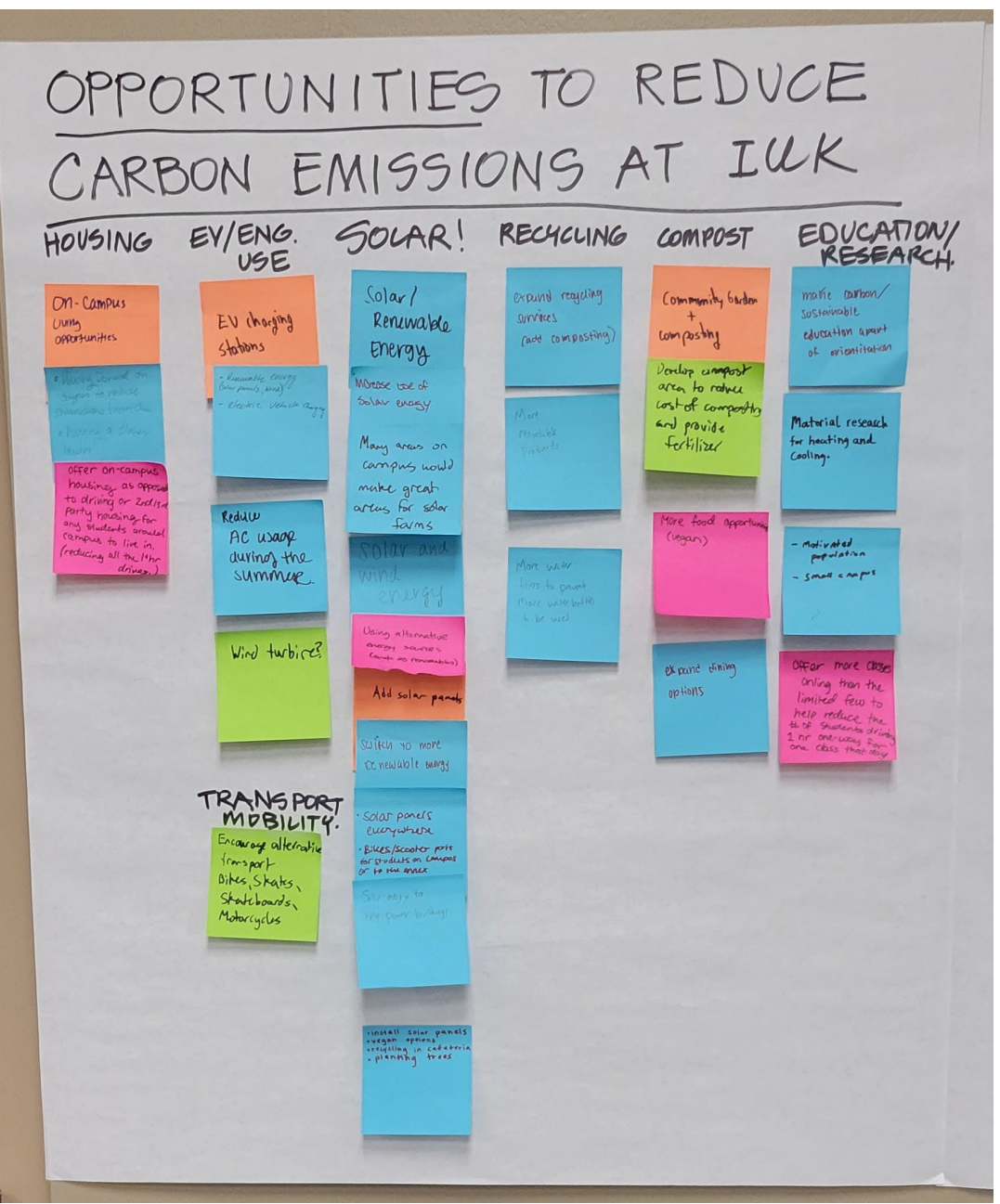
PUBLIC FORUM INPUT QUESTIONS



IUN - GARY



IUPUI - INDIANAPOLIS



IUK - KOKOMO

WHAT ARE SOME CHALLENGES TO REDUCING CARBON EMISSIONS?

PUBLIC FORUM INPUT QUESTIONS

ENERGY USE EFFICIENCY CHALLENGES

TRANSPORT SITE SYSTEMS Utilization PURCHASING POLICIES

Few EV charging spots + lack of parking enforcement

Unreliable & very limited public transportation

EV chargers: Only from some solar panel stations: no access

Old Infrastructure for lab spaces (inefficiency) ? retrofit vs. new builds

Recycle paper & cardboard correctly (unclear currently)

15% Elec. Rate Increase over next few years

No Energy Hubs - Solar? - Funding? - Central Banking

Political influence from state over IU + Board of Trustees

Procurement policy prioritizes cost-savings over sustainability

NSF grants support new equipment over repair

Means of implementation with limited staffing & resources

Integrated under a standard utility regulation

Combined sewer w/ Gary

Indicate a water & wastewater utility regulation

Recycling into streams of water & solar then make water from ~~plants~~ ~~hydrogen~~ with small scale

Consolidate spaces & avoid surplus to build - 6 buildings

Regional Air Quality Issues

Internal Air Quality - No maintenance - Combined storm & sanitary water: Campus - limited capacity

Buy-in from all campus constituents

Disconnected from neighbors & their challenges

Regional autonomy

Commute campus

Cost offset much as energy savings

Can only "offset" NAT'L GAS USED FOR HEATING!

Bottom space management

Lack of regional autonomy

Buy-in from staff / faculty / students

Challenges: To avoid limitations of availability

climactn@iu.edu

IUN - GARY

SHARE CHALLENGES TO REDUCE CARBON EMISSIONS

BEHAVIOR POLICY SITE/SPATIAL

Human behavior: Will people accept changes to comfort?

Lack of knowledge about reducing emissions/Lack of care about reduction.

Sacrificing easy ways of being things

Upfront cost

Pioneered folks blocking progress

IUPUI has multiple research / med facilities as well as a large commuter population...

IUPUI - INDIANAPOLIS

CHALLENGES TO REDUCE CARBON EMISSIONS AT IUK

RENEWABLES CULTURE COST/FUNDING TRANSPORT

Solar panels are costly both in space and price

Building green energy alternative would reduce the appearance of the campus, reduce energy costs

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

Intimidation & scheduling

Reducing outside factors (weather, building, etc.) from interfering with measurement

Costly! too much \$\$\$

Funding

Resources - \$ - time

Cost

Directing money where needed

Cost of restoration

Can't pay tuition & buy a fancy e-vehicle

Increasing the student cost 100 fast/passion

Challenge: A lot of student commute to school

More focus on funding grants

People don't understand that this is important to the school

Spun out

Challenging when this is known as a commuter campus, things aren't taken as seriously

time like water classes &

Source: Every thing eventually

Lack of funds, lack of support, lack of participation

People don't understand that this is important to the school

Spun out

Challenging when this is known as a commuter campus, things aren't taken as seriously

IUK - KOKOMO

OPPORTUNITIES

COMMON THEMES

Consistent focus on renewable energy generation

- Solar
- Wind
- Heat pumps

• Solar panels everywhere
• Bikes/scooter ports 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
~~the~~ 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


AUDIENCE Q&A

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DATA AND INFORMATION REQUESTS

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



INDIANA UNIVERSITY

September 12, 2022
IU Bloomington

Climate Action Committee Meeting

Campus (short)	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 renovationsRoof Replacements/RepairsParkside, Administration, WeikampExterior Stone Repairs/EnvelopeWeikamp, University CenterMechanical Systems UpgradesSchurz 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 LightingParkside 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% LEDImpact of demand load of system and peak period billing	Major Energy Projects (2020 - 2023) <ul style="list-style-type: none">Marram Hall window replacementsHawthorn Hall natural gas conversion and electrical renovationRaintree Hall –HVAC system replacementFacilities Services Electrical and HVAC upgrades (2022-23)Facilities Services Annex HVAC upgrades (2022-23)Tamarack Green SpaceInternal/external LED replacement program ongoing, 90% completeHawthorn Hall window seal replacementAdd sidewalk lighting to south 35th AvenueSavannah hot water heater relocationRaintree Hall classroom and corridor renovationMarram Hall classroom/corridor/lab renovationMarram Hall boiler replacementVarious other projects	<ul style="list-style-type: none">Winter weather tough on equipment (unit exposures resulting in frozen/broken coils and water lines)Little Calumet River flood of 2008 led to demolition of Tamarack HallDegraded air due to proximity of state highwayAvailability of new staff, turnover of workforce, and loss of experienceBudget restrictions or reductions related to student retentionSpace planning and space utilizationSewer back up –Gary Sanitation	<ul style="list-style-type: none">Standardization of intra-campus processesEnhance the effectiveness of our staffImproved energy reductionShared knowledge base between IU campusesProvide responsible stewardshipCommit to sustainable practices (hand driers vs. paper towels)City of Gary conversion of buses to natural gas –green transportation solutions for studentsPlanting trees to help manage stormwater and improve infiltration and offset carbon emissionsOpportunity to become a charging hub under city initiativeConverting 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 ReplacementMultiple Buildings: Replacing pumps, frequency drives and motorsMain Building: Replaced Roof with TPO roofing and added insulationFine Arts Building: Replaced all single pane windows with double pane and insulated storefront glass systemStudent 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, highhorsepower 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 programWater absorbing beads reduce watering demand by 60% for flowers and hanging baskets	<ul style="list-style-type: none">Window replacement in portions of East BuildingKSC/Library Air Handling Units (2)Fine Arts Building Roof Top Heating and Cooling UnitsHunt Hall Roof -White TPO RoofingHunt Hall/Balance of Main Building -Upgrade to DDC controlsUpgrade of campus HVAC Controls to new Siemens system with more control options to improve efficiency.		