WEBINAR

PATHWAYS TO DECARBONIZATION: FROM PLANNING TO COMPLETION

Senior Stewards Acting
for the Environment (SSAFE)

April 3, 2025 | 11 A.M. ET

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WEBINAR GOALS

1. Provide SSAFE audiences with examples of decarbonization options at different scales

2. Offer perspectives on decarbonization pathways, technologies, and trends

3. Answer your questions

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WEBINAR ROADMAP

1. Introductions
2. Decarbonization stories
3. Getting buy-in and raising funds
4. Q&A

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INTRODUCTIONS

CHRIS LEWIS, CEM

Vice President of Engineering

GreenerU

JENNIFER HAUGH

Vice President of Planning and Customer Engagement

GreenerU

ABOUT GREENERU

GreenerU helps institutions navigate the pathways to **decarbonization** through **planning**, **engineering**, and **construction**.

goals and values development

stakeholder buy-in

engineering and design

construction project management

DECARBONIZATION STORIES

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WHAT DO WE MEAN BY DECARBONIZATION?

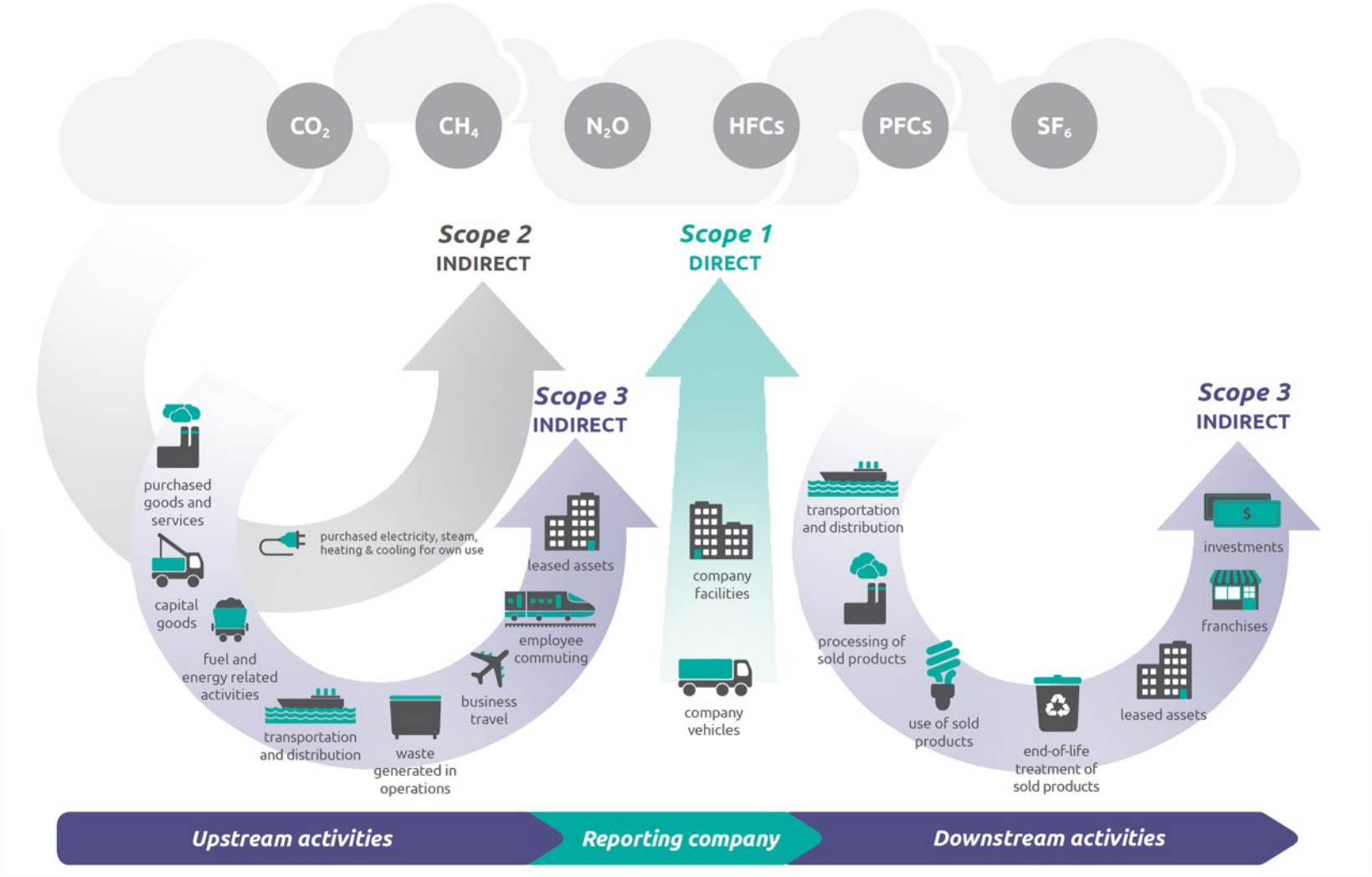
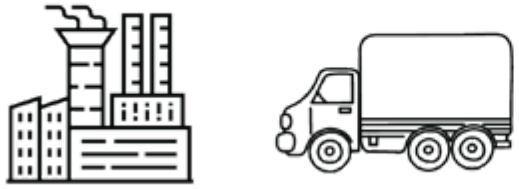


image source: U.S. Environmental Protection Agency

WHAT DO WE MEAN BY DECARBONIZATION?

SCOPE 1



- convert heating to electricity-based heating systems
- invest in zero-carbon fleet vehicles
- invest in energy-efficient building operations

SCOPE 2

- invest in on-site and/or off-site renewable energy
- purchase 100% renewable energy

SCOPE 3

- minimize emissions from commuting and travel
- divest from investments in fossil fuels
- minimize embodied carbon in construction materials
- minimize supply chain emissions
- offset remaining emissions

DECARBONIZING A HOUSEHOLD

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DECARBONIZING AN INSTITUTION

image source: Historic New England

HISTORIC NEW ENGLAND

Historic New England is committed to addressing the global climate crisis through actions that **reduce or eliminate greenhouse gas emissions, promote resiliency, engage our communities, and advance climate justice and energy equity by meeting these four goals by 2050:**

GOAL 1

Enacting operational shifts that integrate climate action into the day-to-day **operations** of Historic New England

GOAL 2

Achieving **carbon neutrality** for all Historic New England sites by 2050, continuously evaluating progress and adjusting actions to achieve success

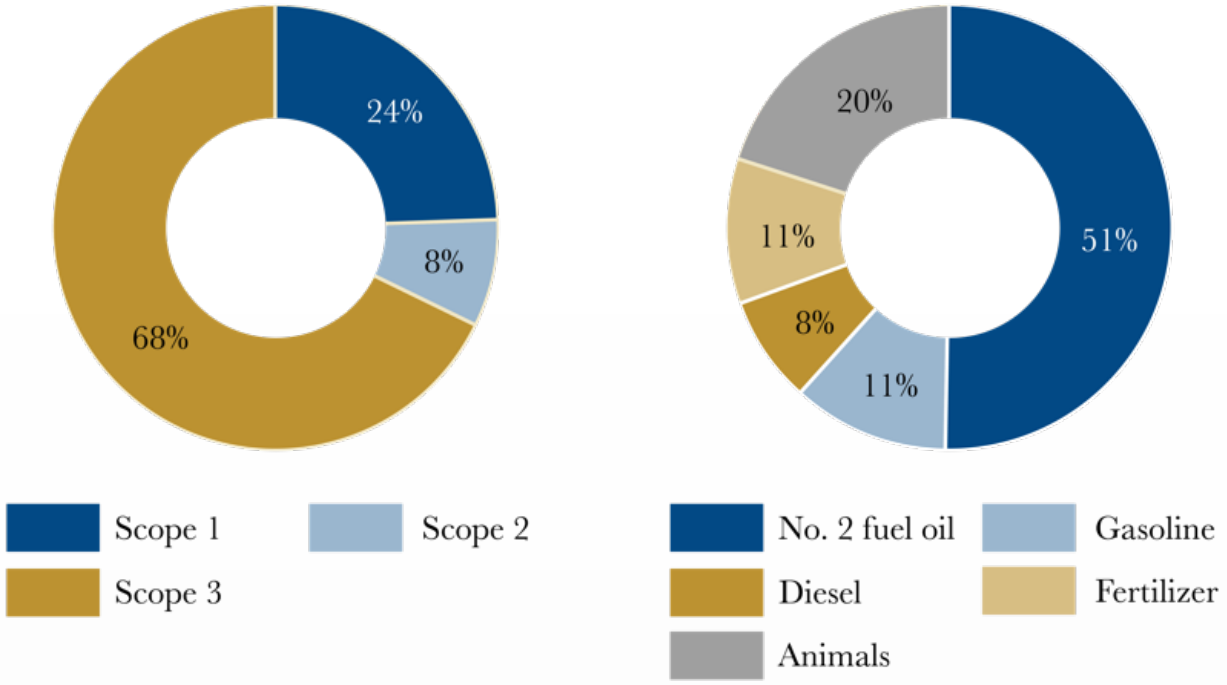
GOAL 3

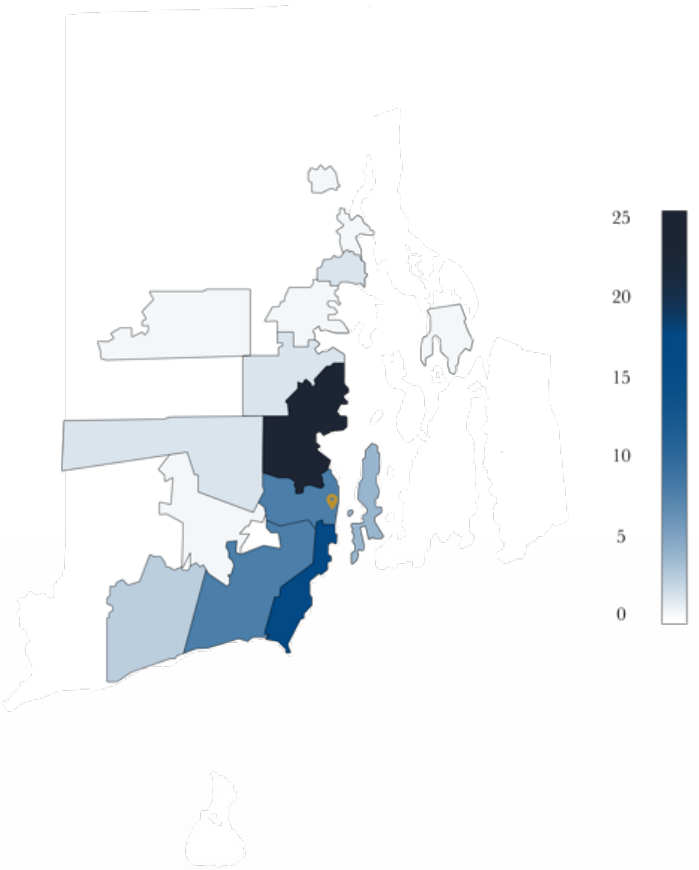
Managing our properties to meet our high preservation standards but also adapting those standards to ensure **resilience** in the face of weather extremes and sea level rise

GOAL 4

Engaging a broad and inclusive public through robust partnerships, programs, and activities that advance **climate justice** for all

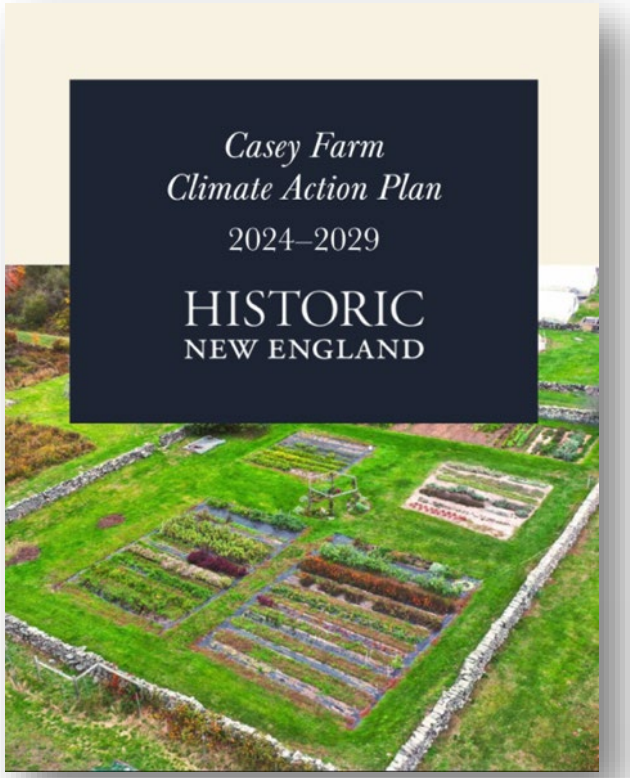
Climate action planning:
baselining (Casey Farm)





Climate action planning:
goal setting (Casey Farm)

Climate action planning:
plan publication



Mitigation

GOAL 7: EMISSIONS

By 2029, Casey Farm will have reduced Scopes 1 and 2 emissions by 20% from a 2022 baseline and expanded Scope 3 emissions tracking for waste and commuting.

STRATEGIES

7.1 Secure funding for multiple components of emissions mitigation by the beginning of 2027

7.2 Develop and implement historically appropriate energy-efficiency measures to reduce overall energy demand at Casey Farm infrastructure

7.3 Where possible, electrify Casey Farm's operations

7.4 Increase Casey Farm's on-site renewable energy generation

7.5 Measure and benchmark annual utility, commuting, and waste data starting in 2024

DETERMINANTS OF SUCCESS

- Scope 1 emissions are 27.2 MTCO2e and Scope 2 emissions are 8.8 MTCO2e in 2029
- More accurate methods are employed to track waste and commuting data, including for farm staff and visitors

Climate action planning:
engineering and construction

1. Upgrade lighting to LED
2. Upgrade HVAC to heat pumps
3. Convert irrigation to solar
4. Explore on-site renewable electricity generation
5. Weatherize buildings
6. Install museum-grade climate control system

DECARBONIZING A MEDICAL SCHOOL CAMPUS

BASELINE FINDINGS

As a medical school campus, UMass Chan faces unique decarbonization challenges.

UMass Memorial is a 24-hour care facility

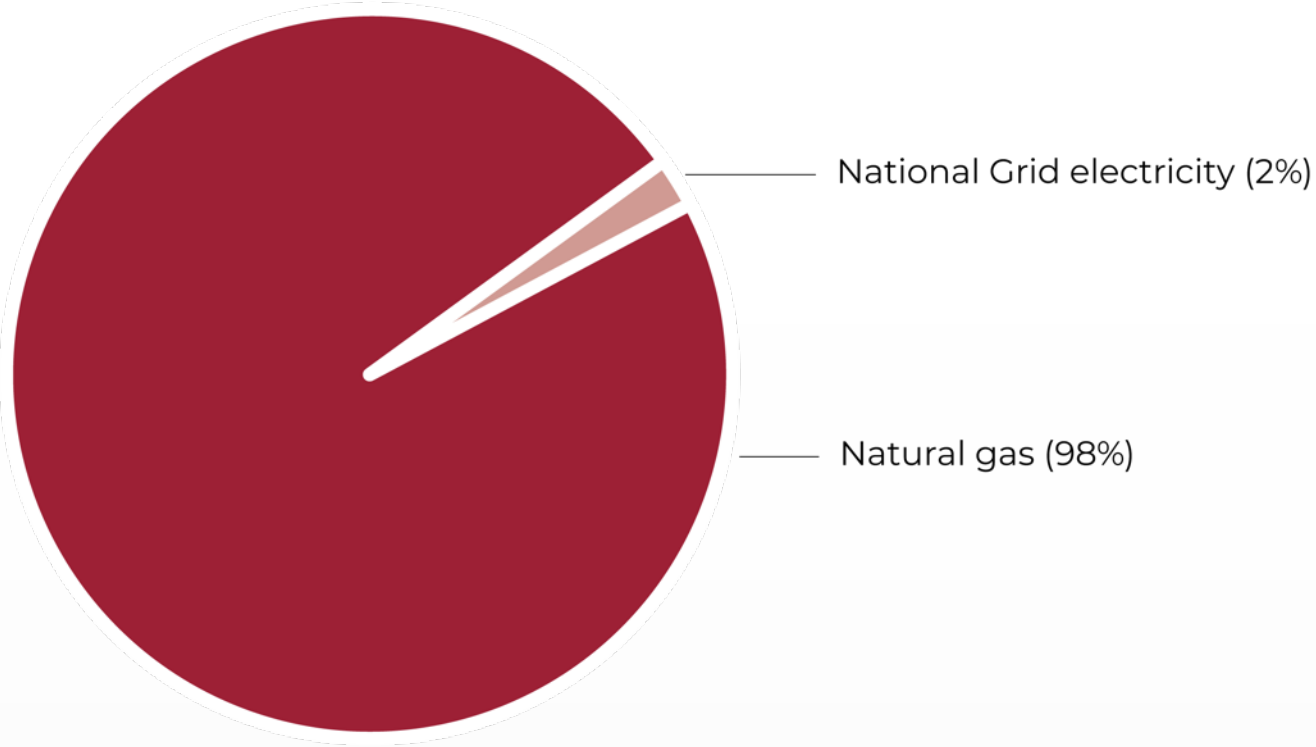
The campus requires back-up power redundancy

Laboratory research is energy-intensive

BASELINE FINDINGS

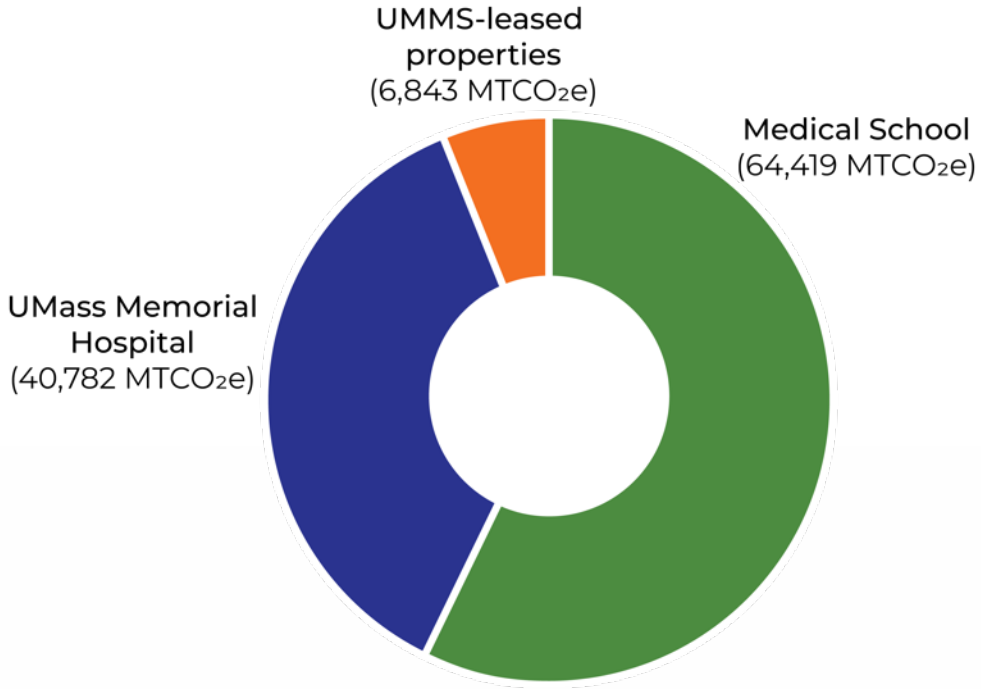
UMass Chan relies on natural gas for 98% of its source energy; 91% of campus electrical usage is produced on site.

Figure. — UMass Chan energy composition (2021 data)



UMASS CHAN MEDICAL SCHOOL

- UMass Chan's 2021–2026 Climate Action Plan calls for a 20% EUI reduction by 2026.
- UMass Chan hopes to decarbonize Scope 1 emissions by 2035.
- Massachusetts' goal is to reach net-zero emissions by 2050 (per E.O. 594).

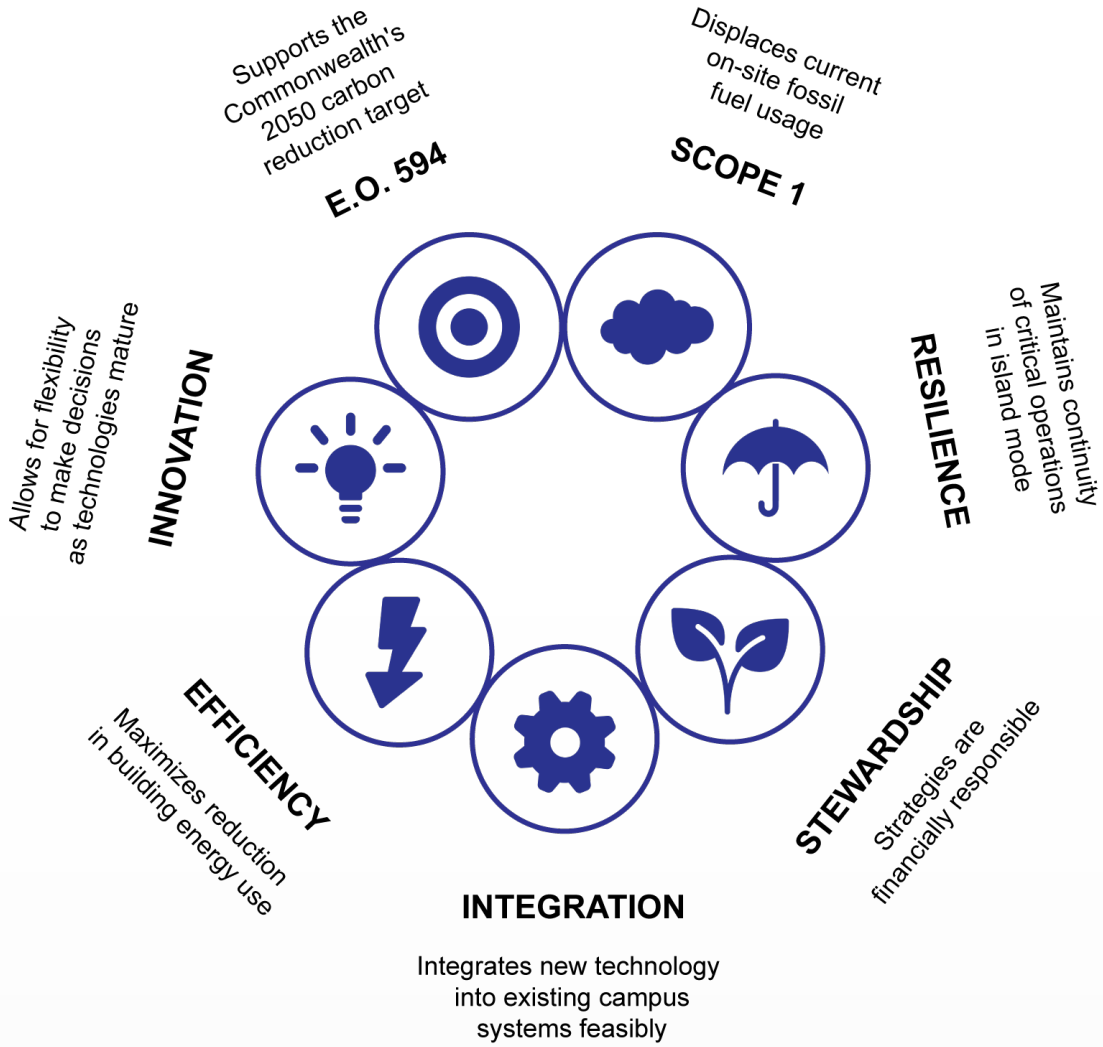


Worked with Arup and GreenerU to navigate the process:

- Involving stakeholders throughout
- Weighing available and upcoming technologies
- Weighing all options against campus priorities

				AVERAGE SCORE
5	5	5	5	5.00
5	5	5	5	5.00
5	4	3	4	4.00
3	3	4	2	3.00
3	4	4	3	3.50
2	4	4	2	3.00

UMASS CHAN MEDICAL SCHOOL



GROWING GREEN

presents a carbon-cutting drop-in

open house!

Wed., Jan. 19, 9 a.m. to 3 p.m.
Sherman Center Cafe

home-baked cookies · coffee · giveaways for reusable mug users

earth month webinar series

What is micro nuclear energy?
Friday, April 14
3–4 p.m. ET

with **Jacopo Buonguiorno, Ph.D., MIT**

Is electrification the answer?
Friday, April 21
3–4 p.m. ET

with **Chris Lewis, CEM, GreenerU**

Hydrogen and other biofuels
Friday, April 28
3–4 p.m. ET

with **Bryan Pivovar, Ph.D., NREL**

visit umassmed.edu/growinggreen/earthmonth2023 to register

UMass Chan MEDICAL SCHOOL

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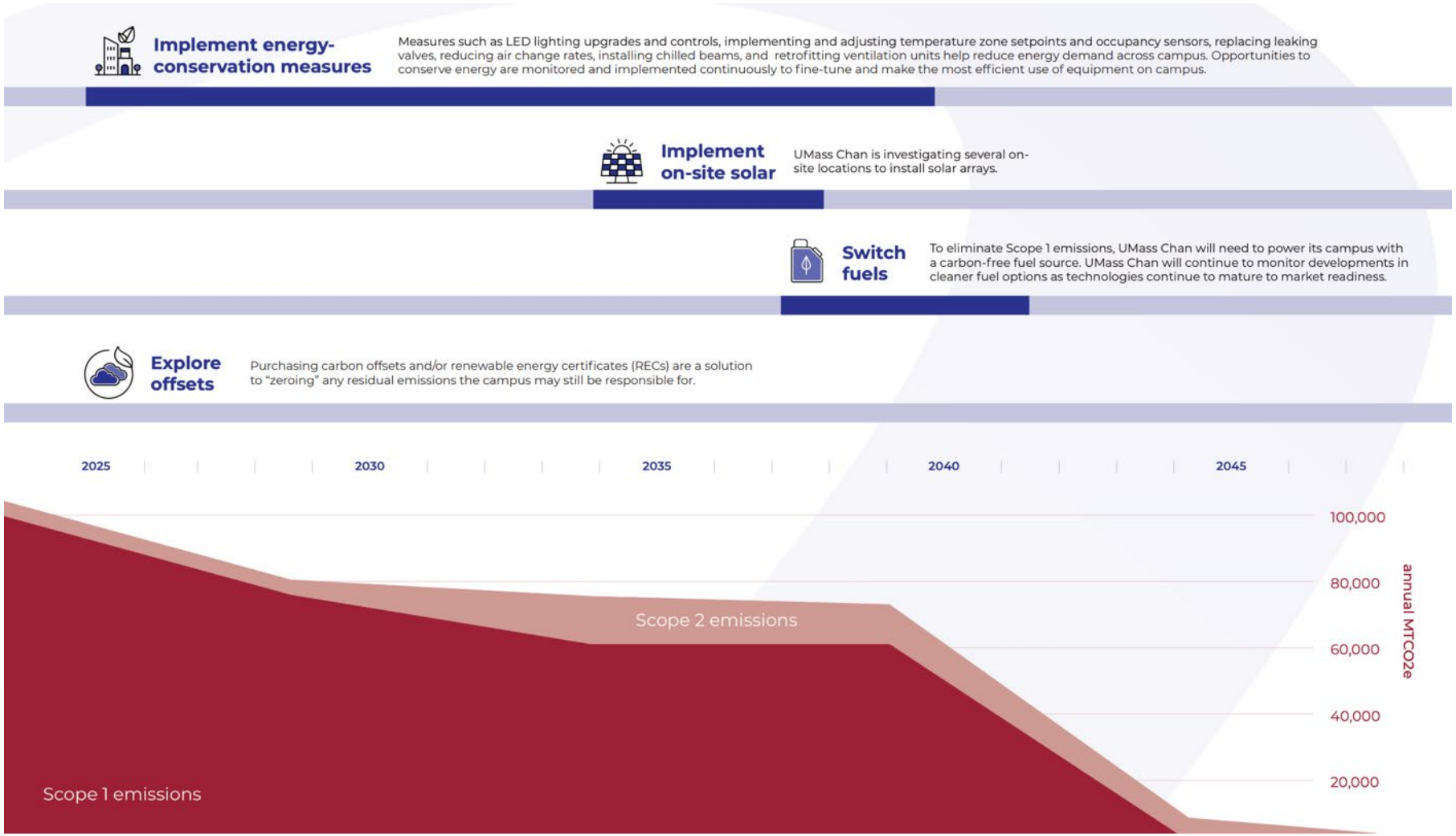

KEY TAKEAWAYS

- Get the data
- Get buy-in
- Technical solutions are not the only consideration
- Decision-making is iterative
- Decarbonization can be gradual
- Achieve what you can; don’t beat yourself up if 100% is out of reach right now

GETTING BUY-IN AND RAISING FUNDS

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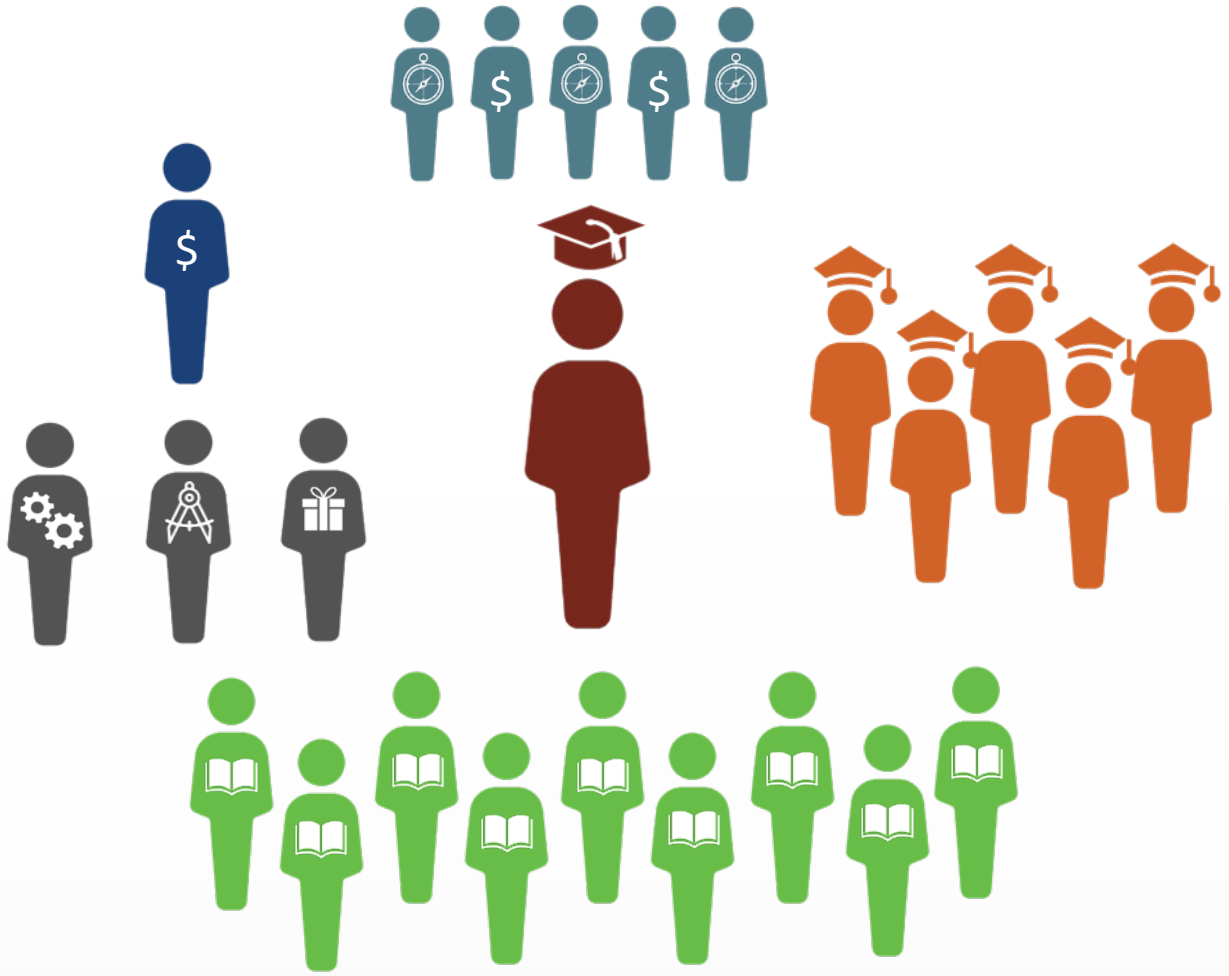
A CASE FOR STAKEHOLDER ENGAGEMENT

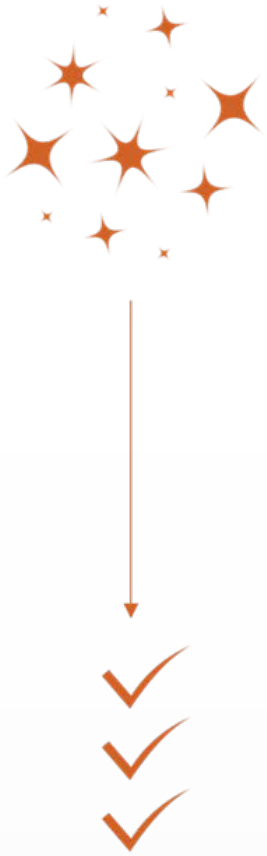
WHY IS ENGAGEMENT IMPORTANT?

THE PLANNING PROCESS

STAKEHOLDER MAPPING



FROM VISION TO ACTION



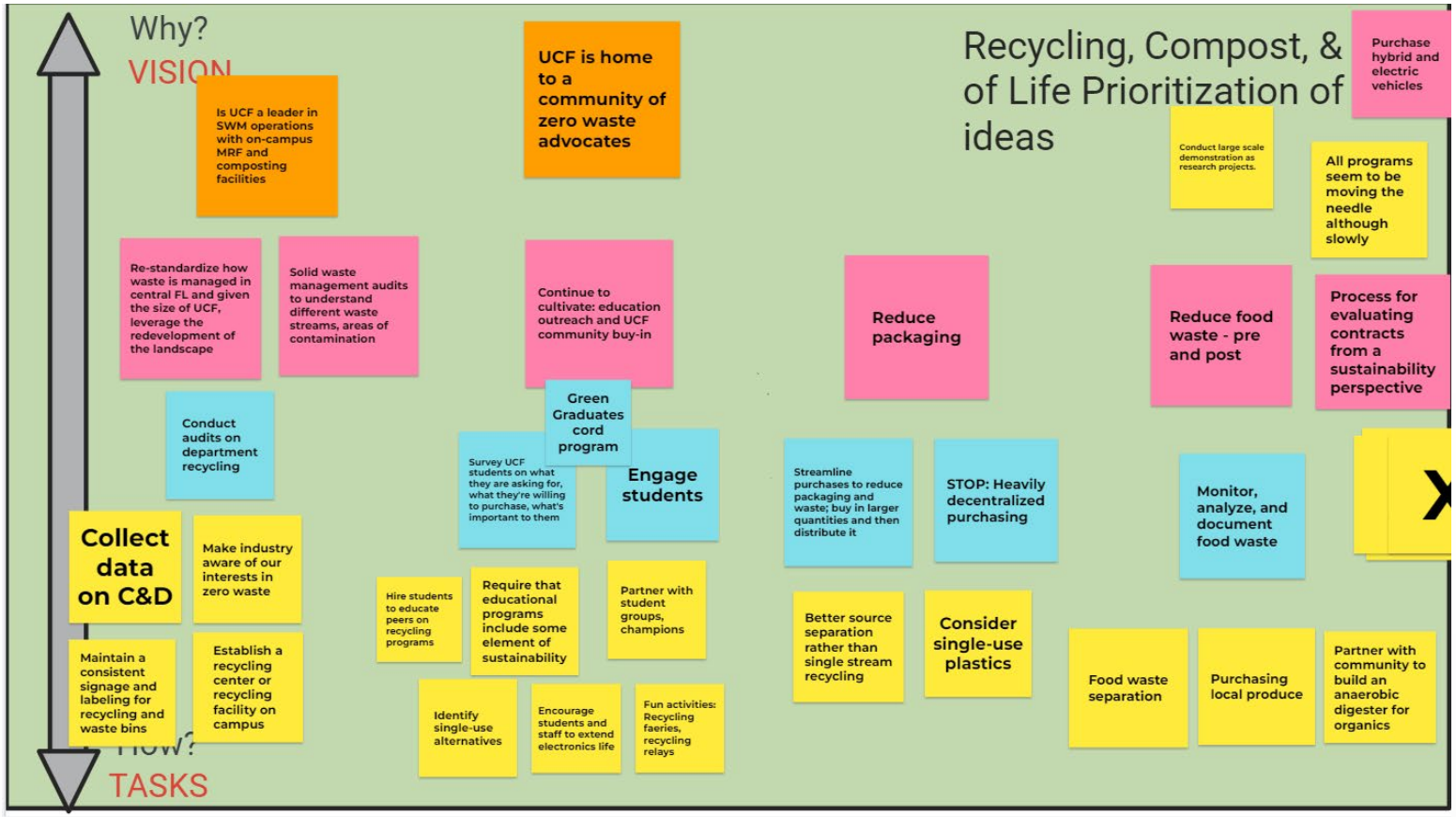
VISION — Inspirational—the desired state, the big picture

GOAL — Aspirational—a desired result in support of the vision

STRATEGY — Directional focus—specific programs or projects in support of the goal

ACTION — Task—breakdown of important steps that support strategies for each goal

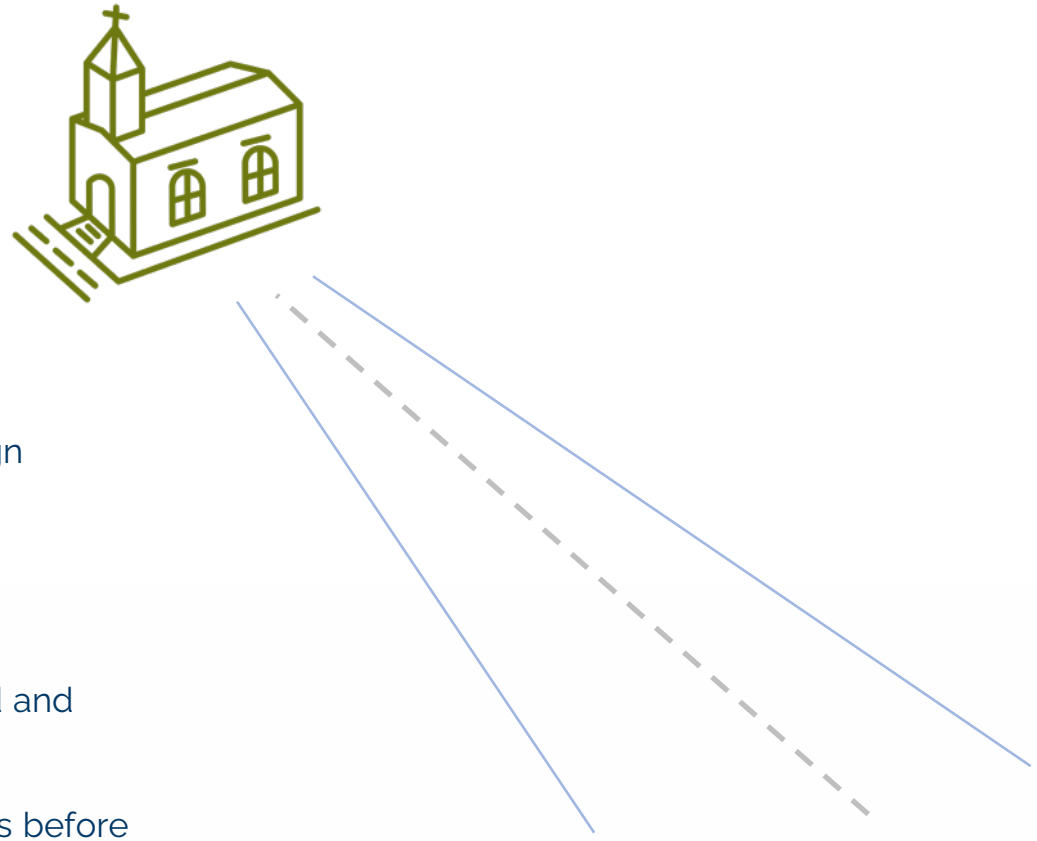
WHY/HOW


Why?
VISION
Is UCF a leader in SWM operations with on-campus MRF and composting facilities
UCF is home to a community of zero waste advocates
Re-standardize how waste is managed in central FL and given the size of UCF, leverage the redevelopment of the landscape
Solid waste management audits to understand different waste streams, areas of contamination
Continue to cultivate: education outreach and UCF community buy-in
Conduct audits on department recycling
Green Graduates cord program
Survey UCF students on what they are asking for, what they're willing to purchase, what's important to them
Engage students
Collect data on C&D
Make industry aware of our interests in zero waste
Hire students to educate peers on recycling programs
Require that educational programs include some element of sustainability
Partner with student groups, champions
Maintain a consistent signage and labeling for recycling and waste bins
Establish a recycling center or recycling facility on campus
Identify single-use alternatives
Encourage students and staff to extend electronics life
Fun activities: Recycling faeries, recycling relays
HOW?
TASKS
Recycling, Compost, & of Life Prioritization of ideas
Purchase hybrid and electric vehicles
Conduct large scale demonstration as research projects.
All programs seem to be moving the needle although slowly
Reduce packaging
Reduce food waste - pre and post
Process for evaluating contracts from a sustainability perspective
Streamline purchases to reduce packaging and waste; buy in larger quantities and then distribute it
STOP: Heavily decentralized purchasing
Monitor, analyze, and document food waste
Better source separation rather than single stream recycling
Consider single-use plastics
Food waste separation
Purchasing local produce
Partner with community to build an anaerobic digester for organics

THE SCALE OF AGREEMENT

SCALE OF AGREEMENT ADAPTED FROM KANER ET AL.				
1	2	3	4	5
WHOLE-HEARTEDLY AGREE	AGREEMENT WITH A MINOR POINT OF CONTENTION	SUPPORT WITH RESERVATION	MORE DISCUSSION NEEDED	SERIOUS DISAGREEMENT
"I really like it"	"Not perfect but it's pretty good"	"I could live with it"	"There are small concerns to discuss before I could support"	"I am not on board with this"
VOTE BELOW				

GETTING BUY-IN TO RAISE FUNDS



PROS:

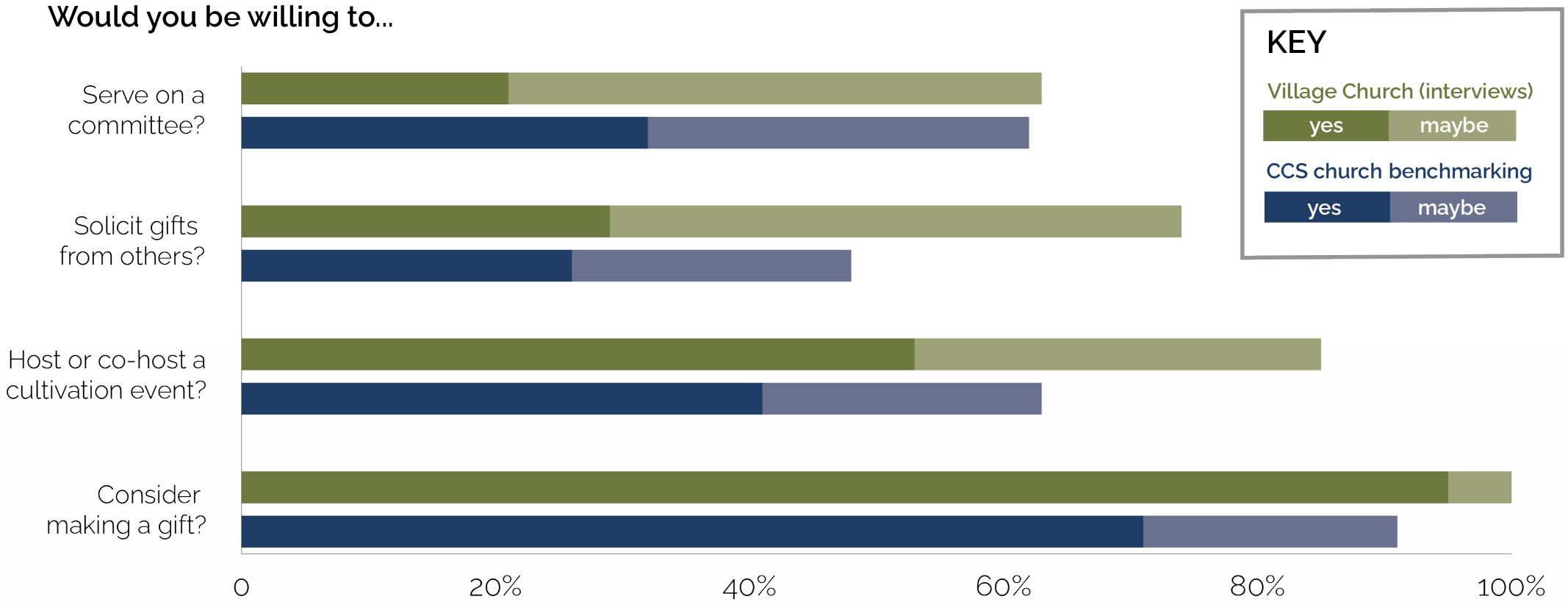
- No interest payments to be paid
- Protects us against missed expectations on capital campaign
- Extracts more value from our existing system

CONS:

- Vulnerable to price changes with both technologies
- Our current system may need major repairs with unplanned and emergency expenditures
- More years of heating with oil
- We will need to finance with endowments and contributions before rebates are received

Conducting a capital campaign (fundraising)

GETTING BUY-IN TO RAISE FUNDS



GETTING BUY-IN TO RAISE FUNDS

Historic New England was able to leverage their plan:

- To fund its implementation
- To fund similar planning efforts at other sites
- To turn engagement across program areas into support for climate action

“Replacing a roof” vs. “advancing institutional resiliency goals”

Q&A

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