

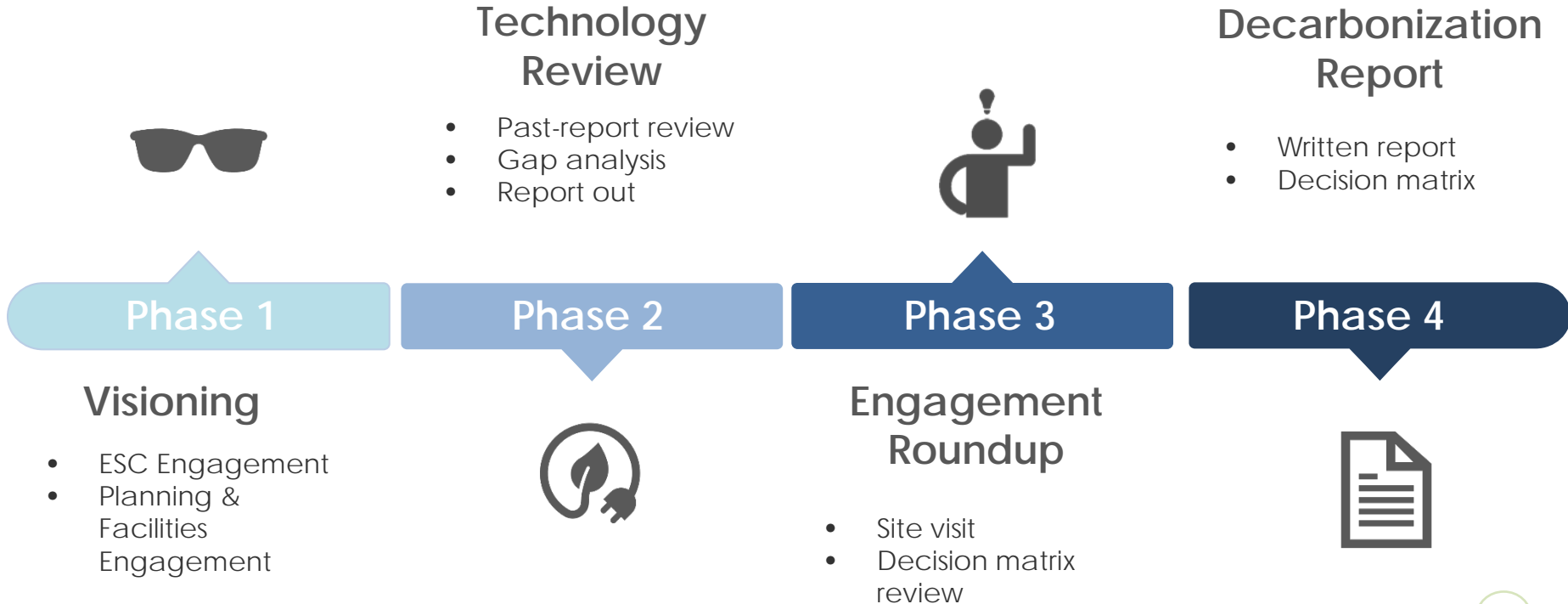
Decarbonization Roadmap

ESC Presentation
March 4, 2022



KPU2050

Roadmap Process



What We Heard



Visioning Workshops

1. Environmental Sustainability Committee
 - Identify **opportunities** and **challenges** associated with reducing GHG emissions from KPU's buildings?
 - Identify and rank priorities
2. Facilities and Campus and Community Planning
 - Chose a selection of priorities based on past conversations with Facilities and CCP
 - Ranked these priorities

KPU Values / Climate Action

ESC: “What our purpose is as a university is established in the Vision 2023 and this work should align with the university’s mission / vision. There is an expectation for the university to be a leader.”

ESC: “Recently came from President’s Council discussion - some people are saying 2050 is too far out for our GHG reduction targets. We should go for 2030. There is appetite to go more aggressively than we had thought. Appetite to do this quicker if possible.”

ESC: “It is not so much an opportunity, as it is our duty to be a leader in reducing our GHGs. We should be exemplars, and take some risks.”

ESC: “Lead by example, showcasing progressive systems, which move towards decarbonization.”

Flexibility

ESC: “We can’t always anticipate when change may occur either, but we can build in flexibility into all three approaches to accommodate future divergent opportunities (e.g. if we get money we can make bigger changes, faster).”

Facilities and CCP: “Scalability - e.g. if funding opportunities open up, can adapt to funding available (can expand or contract based on funding availabilities.”

Facilities and CCP : “From a facilities perspective we see the incremental and windfall approaches as almost same thing. Either way the roadmap will be developed. The timescale is different: the roadmap stays the same and timescale may adjust.”

Facilities and CCP : “Don’t want to be landlocked into pathways.”

Innovation

ESC: “New management and maintenance skills may be needed to run new systems.”

ESC: “Demonstrating new ideas/innovations to our community.”

ESC: “There are huge opportunities for education.”

Facilities and CCP : “Showcase teaching or research element can be used to pitch to funders”

Facilities and CCP : “Looking for newer age, leading technology, innovative options rather than an asset replacement plan.”

Budget

ESC: “I think that we need to have a real idea of what cost means. Dollars are just numbers but the cost of doing nothing is clear. Real world effects are already being felt and we are hand wringing over money while facing an extinction level event.”

Facilities and CCP : “Fixed operating budgets... Limited funding to spend on capital, but operating budgets are also tight. If spend more \$ on electricity, cost implications”

Facilities and CCP : “The interests of reducing emissions in a timely way may not be consistent with the interests of being cost effective. In other words, there may be a premium to be paid to reduce emissions quickly vs taking a long-term replacement approach.”

Facilities and CCP : “If we had the money we would do it quicker. 2050 doesn't feel good- we would like to move faster but budget is a limitation. There may be new targets that come in.”

Visioning Sessions - Outcome

Priorities	Theme	Session	Rank (23=High, 1=Low)
Leverage internal or external funding	Budget	Stakeholder Engagement Session #2 (Facilities & Planning)	23
Demonstrate sustainability and climate action leadership	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	21
Improve social and environmental outcomes	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	21
Tackle climate change as quickly as possible	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #1 (ESC)	20
Improve climate resiliency of our facilities	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	19
Learn from and collaborate with peer institutions	Innovation	Stakeholder Engagement Session #1 (ESC)	18
Maximize innovation	Innovation	Stakeholder Engagement Session #1 (ESC)	16
Leverage research & development opportunities	Innovation	Stakeholder Engagement Session #1 (ESC)	16
Align with long term KPU master plans	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	12
Meet our incremental targets on schedule	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	12
Align with KPU values	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	12
Enable flexibility	Flexibility	Stakeholder Engagement Session #2 (Facilities & Planning)	12
Engage researchers and students in testing new technologies	Innovation	Stakeholder Engagement Session #1 (ESC)	11
Meet our targets ahead of schedule	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	10
Take into account total cost of ownership / life cycle costing	Budget	Stakeholder Engagement Session #2 (Facilities & Planning)	8
Align with long term capital planning	Budget	Stakeholder Engagement Session #2 (Facilities & Planning)	8
Keep operating costs low	Budget	Stakeholder Engagement Session #2 (Facilities & Planning)	7
Taking a whole systems approach to retrofit	Flexibility	Stakeholder Engagement Session #2 (Facilities & Planning)	6
Meet our targets at the lowest life cycle cost	Budget	Stakeholder Engagement Session #2 (Facilities & Planning)	5
Align with or exceed provincial targets	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	3
Align with Other Prov Priorities (other than targets)	KPU Values / Climate Action Leadership	Stakeholder Engagement Session #2 (Facilities & Planning)	3
Meet our targets at the lowest capital cost	Budget	Stakeholder Engagement Session #2 (Facilities & Planning)	2
Minimize costs	Budget	Stakeholder Engagement Session #1 (ESC)	1

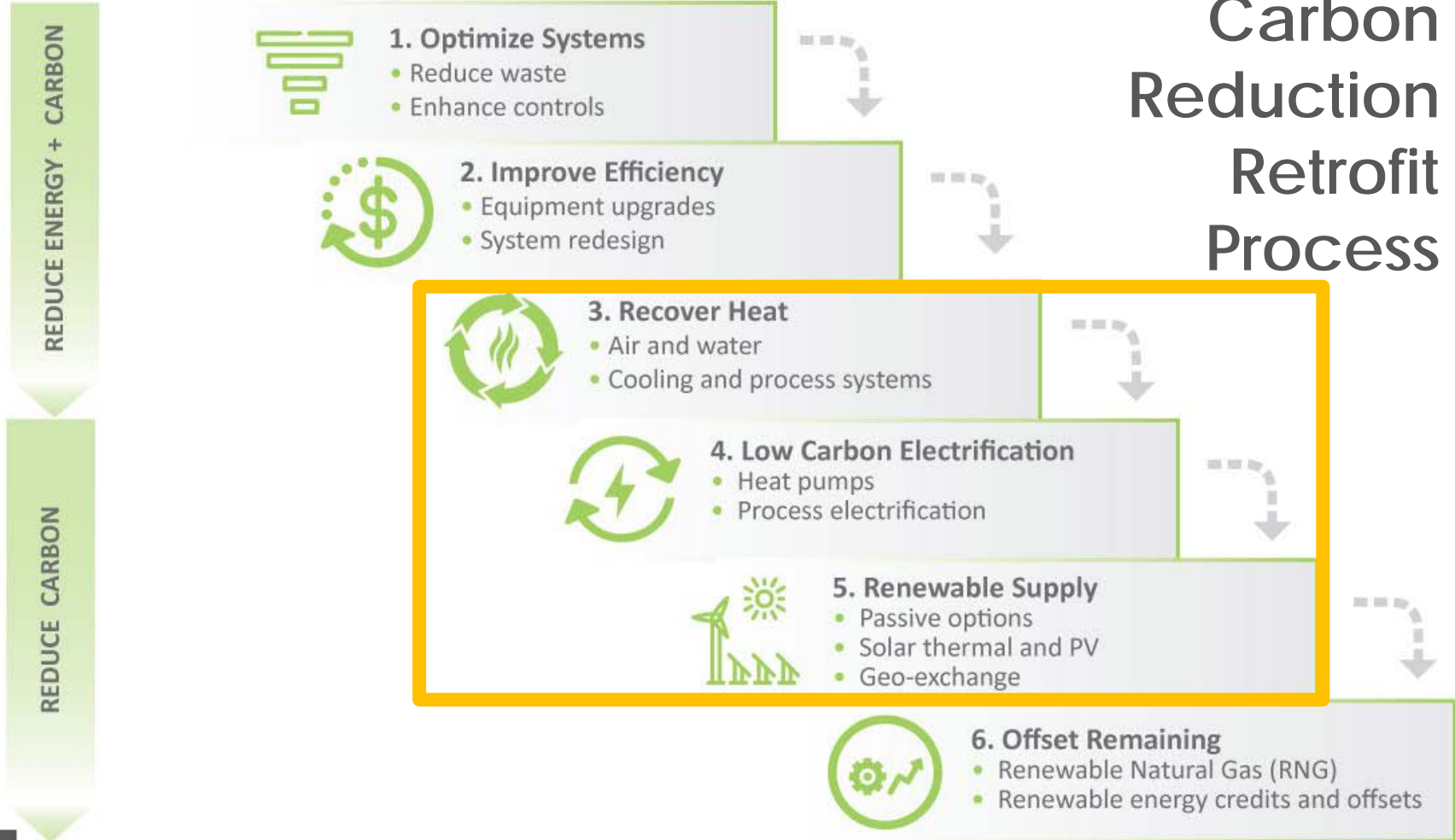
KPU Priorities

KPU Values / Climate Action Leadership	
1	Demonstrates sustainability and climate action leadership
2	Achieves all GHG targets on time, or earlier
3	Demonstrates innovation
Budget	
4	Flexible roadmap
5	Low cost per ton of avoided carbon
6	Highest NPV
Operations	
7	Low maintenance requirement
8	High system reliability
9	Systems operations are aligned with current staff resources
To Consider	
10	<i>Equipment lifespan</i>
11	<i>Considers a whole systems approach to retrofits</i>
12	<i>Peak load</i>
13	<i>Obsolescence</i>

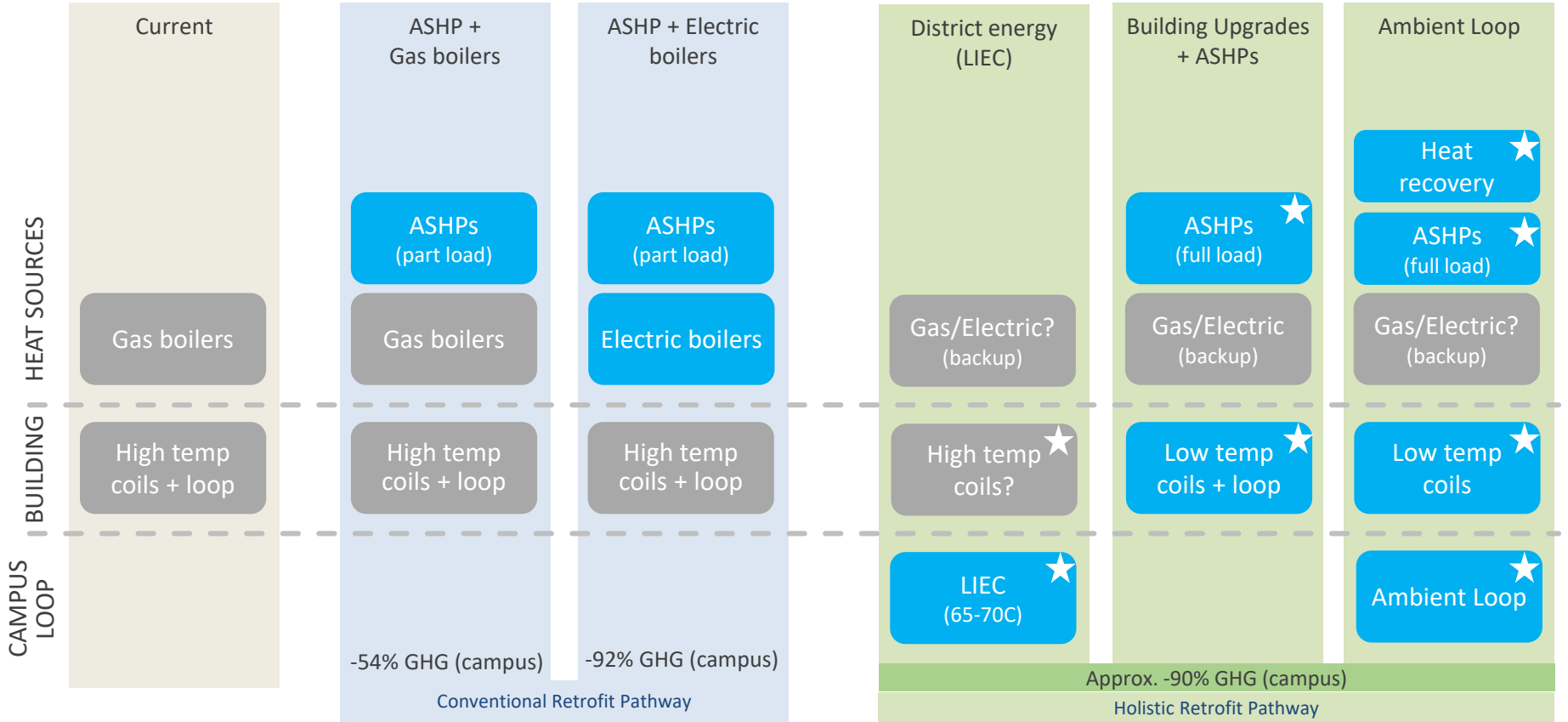
Retrofit Pathway Exploration



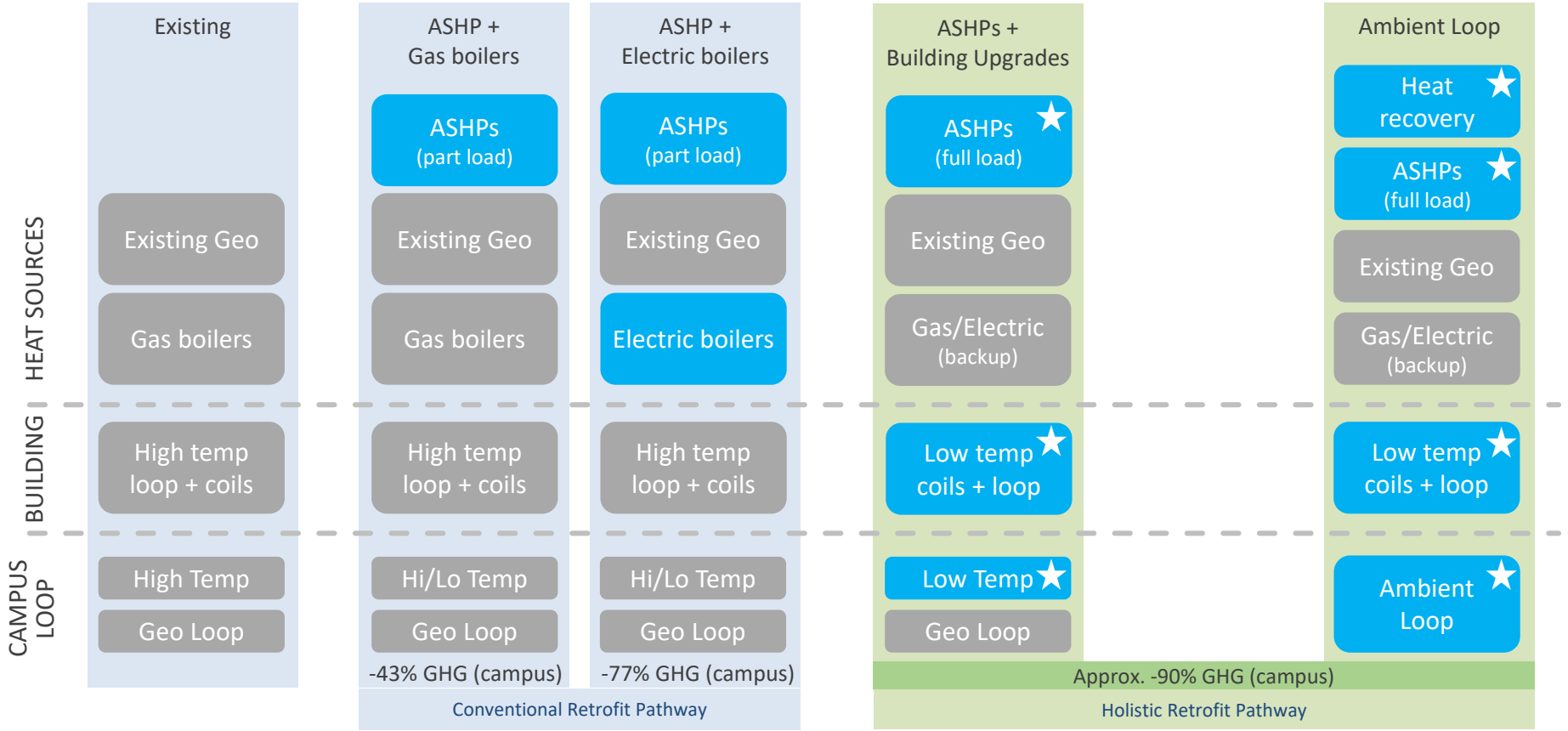
Carbon Reduction Retrofit Process



Pathways – Richmond Main



Pathways – Surrey Campus



Conventional Retrofit Pathway

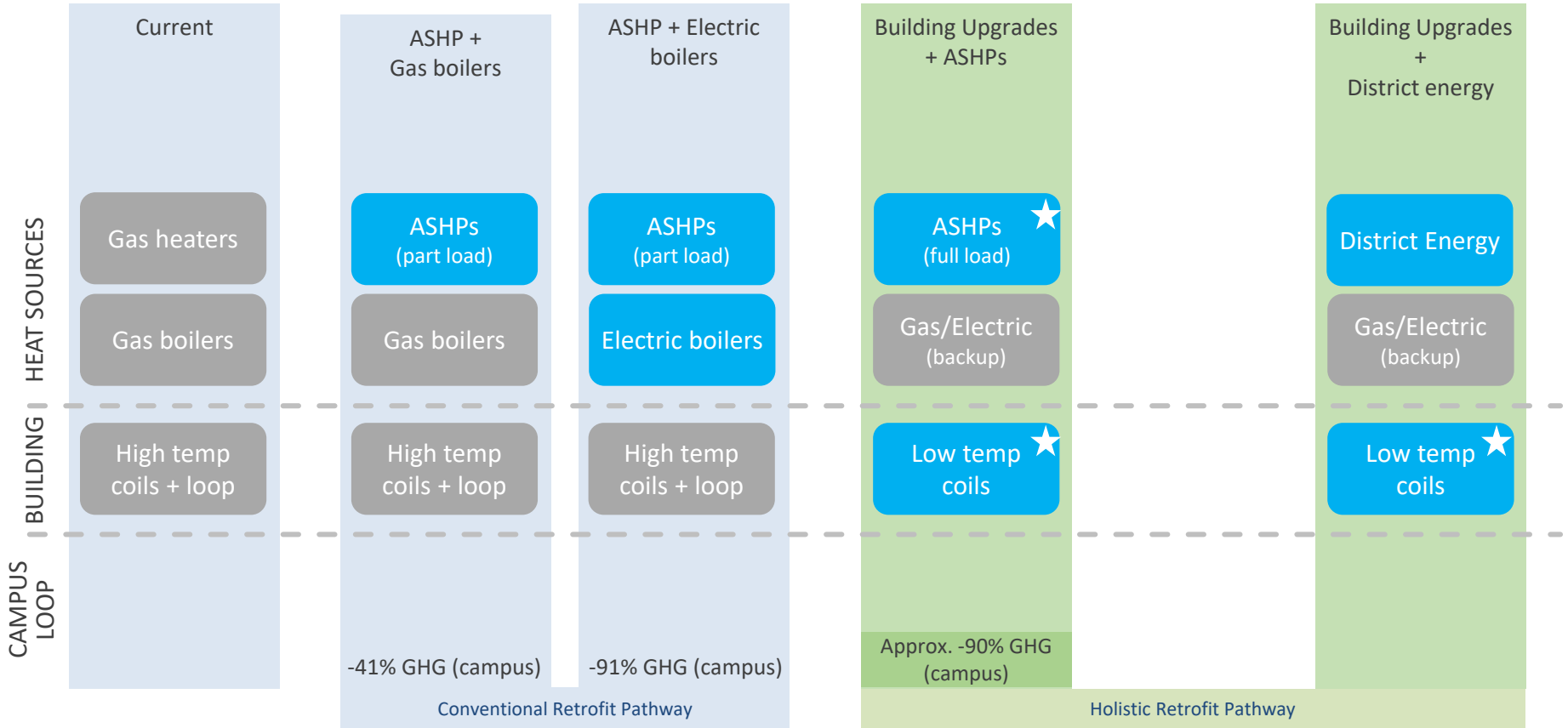
Holistic Retrofit Pathway

Pathways – Tech Campus

☆ Study

New

Existing

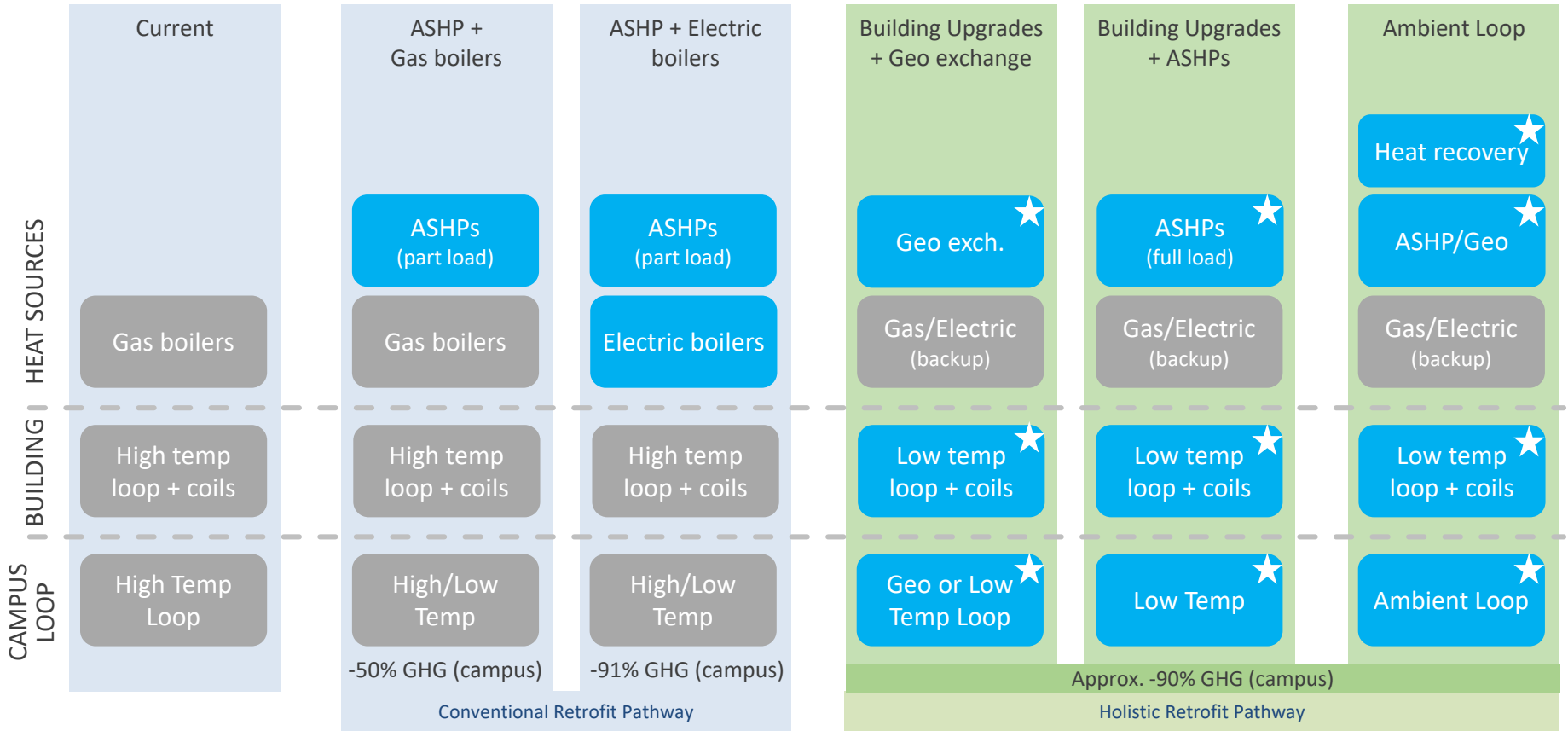


Pathways – Langley South

☆ Study

New

Existing



The Crossroads

Conventional Retrofit

- Focus primarily on supply
- Energy reduction not a primary focus



Holistic Carbon Retrofit

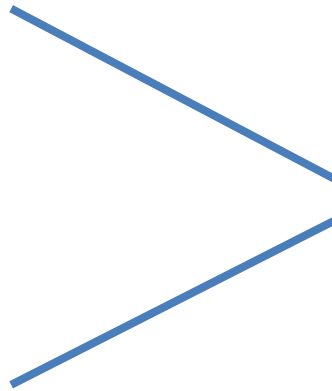
- Whole building approach
- Opportunities for significant GHG *and* energy reduction

Financing

Conventional
Retrofit
(focus on supply)

Holistic Carbon
Retrofit
*(focus on whole
buildings)*

Self-Funded



Outsource
Financing

Third Party Financed

Next Steps



Next Steps

Phase 4: Decarbonization Roadmap Report

1. Overall project approach, methodology and assumptions
2. A comparison of each retrofit pathway including:
 - a. Reviewed technologies
 - b. Alignment with Vision
 - c. Potential implementation timeline
 - d. GHG impacts over time
 - e. Capital and Operations forecast
 - f. Technological risk assessment
3. Provision of a decision making matrix

Post-Project



Refine
Decarbonization
Plan



A

B

C

Detailed
Feasibility
Assessments



Design
Development and
Implementation