

Roadmap to Resilient, Ultra-Low Energy Buildings and Deep Integration of Renewables

Canadian Academy of Engineering
UVic ReBuild Project

Concordia Centre for Zero Energy Building Studies

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à consommation nulle d'énergie

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What is the Roadmap?

- Public policy guidance to improve the resilience and affordability of buildings and achieve decarbonization
- A compelling and achievable vision for a resilient and decarbonized building stock in Canada in 2030 to 2050
- Indicators of success and measurable outcomes of benefit to society and building owners
- Illustrative case studies of buildings that align with the vision
- Principles to inform public policy and key influencers
- A call to action for the engineering profession to lead the transformation and establish building innovation ecosystem
- <https://www.cae-acg.ca/resilient-building/>



Principles for Policy Makers

1. Facilitate Integrated Demand- and Supply-side Resource Planning
2. Focus on Performance Outcomes that Foster Competition and Enable Innovation
3. Allocate Jurisdictional and Institutional Responsibility
4. Leverage Building Lifecycle Investment Triggers
5. Facilitate Data-driven, Outcome-based Policymaking



1. Facilitate Integrated Resource Planning

Governance	Residential	Commercial	Institutional	Rental & Social Housing
Land Use Planning	Local / Indigenous Government Planning			[P/T Emerging]
Construction	Building Codes, Utility Subsidies, Reach Codes (institutional, social)			
Equipment	Federal and Provincial Energy Efficiency Act, Utility Subsidies			
Asset Management	Mandatory Depreciation Report	N/A	P/T Capital Asset Management Framework	
Renewal	Building Codes, Utility Subsidies, Tax credits			+ Design guidelines, Rent control, P/T Investment
Real Estate	Real estate labelling	Benchmarking	N/A	LG Tenant protection
Electricity Supply	Public Utility Commission (planning, projects, supply, rates) + Clean Electricity Standard			
Methane and H2	Public Utility Commission (planning, projects, supply, rates) + Carbon Cap			
Distributed Energy	Public Utility Commission (planning, projects, supply, rates) + LG ownership & bylaws			

Proposed Planning Approach – by Sector

Current Planning Approach – by Governance Silo

2. Focus on Performance Outcomes that Foster Competition and Enable Innovation

- Establish common performance standards across objectives and regulatory frameworks
- Empower professionals to design to those goals and co-optimize design across objectives and across regulatory frameworks
- Harmonize all regulatory frameworks to avoid conflicts preventing co-optimization.
- Maximize flexibility on pathways to achieve goals for those objectives, thereby enhancing innovation, competition and cost-minimization.
- Establish an “innovation ecosystem” within key professional and institutional communities
- Develop adaptative design solutions and avoid prescriptions with dead ends, despite known changing conditions.
- Focus on risk identification, vulnerability assessment and mitigation versus exposure to recovery and damage costs.
- Communicate extensively with governments on potential adjustments to policy frameworks to enhance performance, innovation and resilience, as opposed to a “compliance mindset”.



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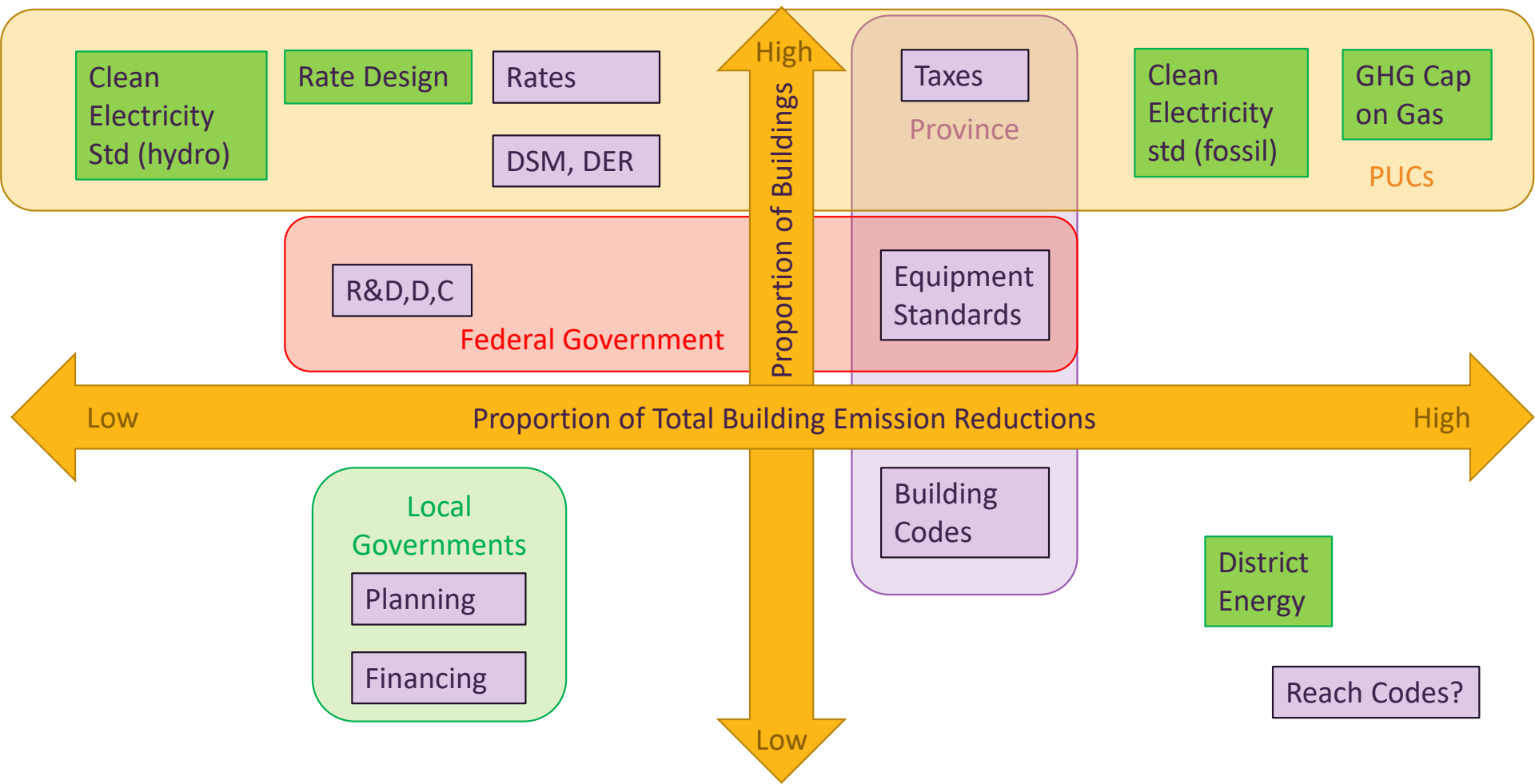
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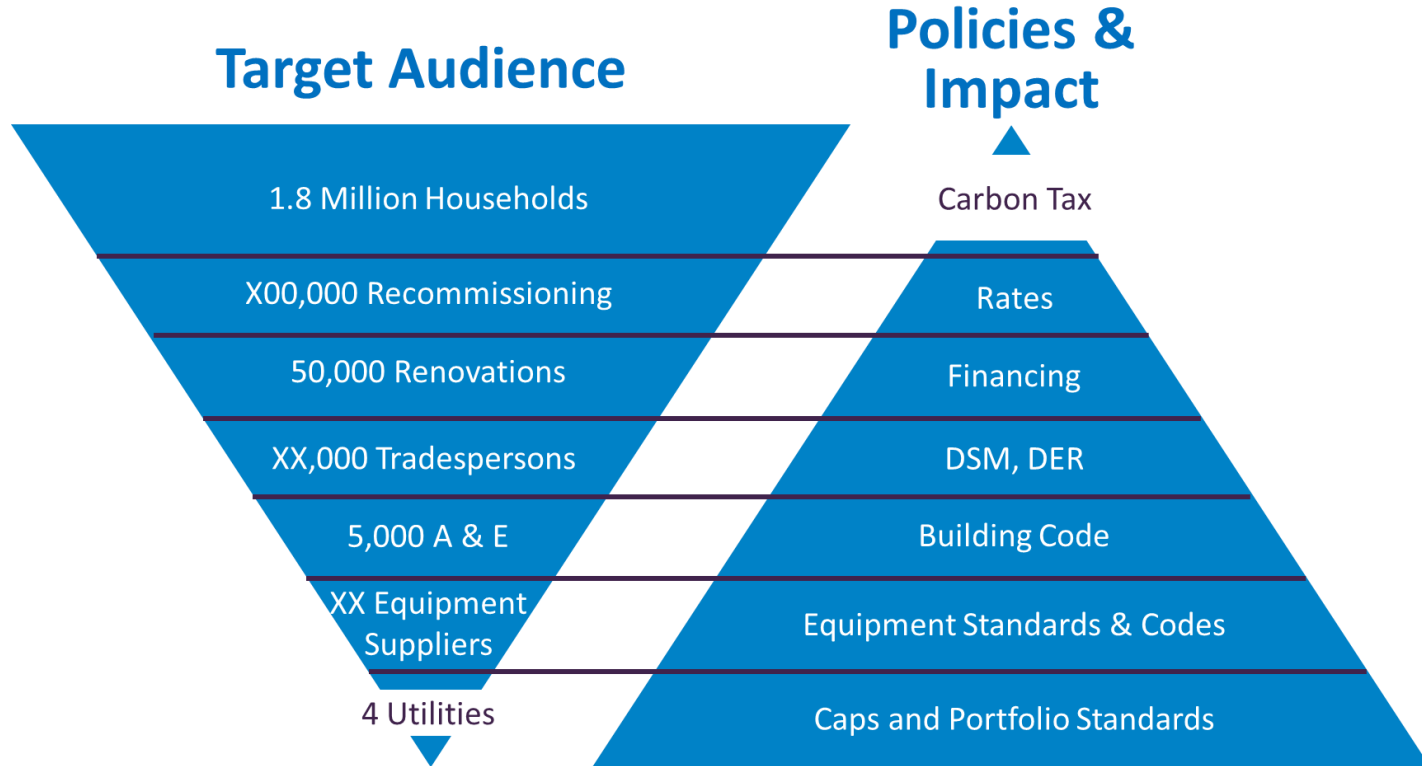
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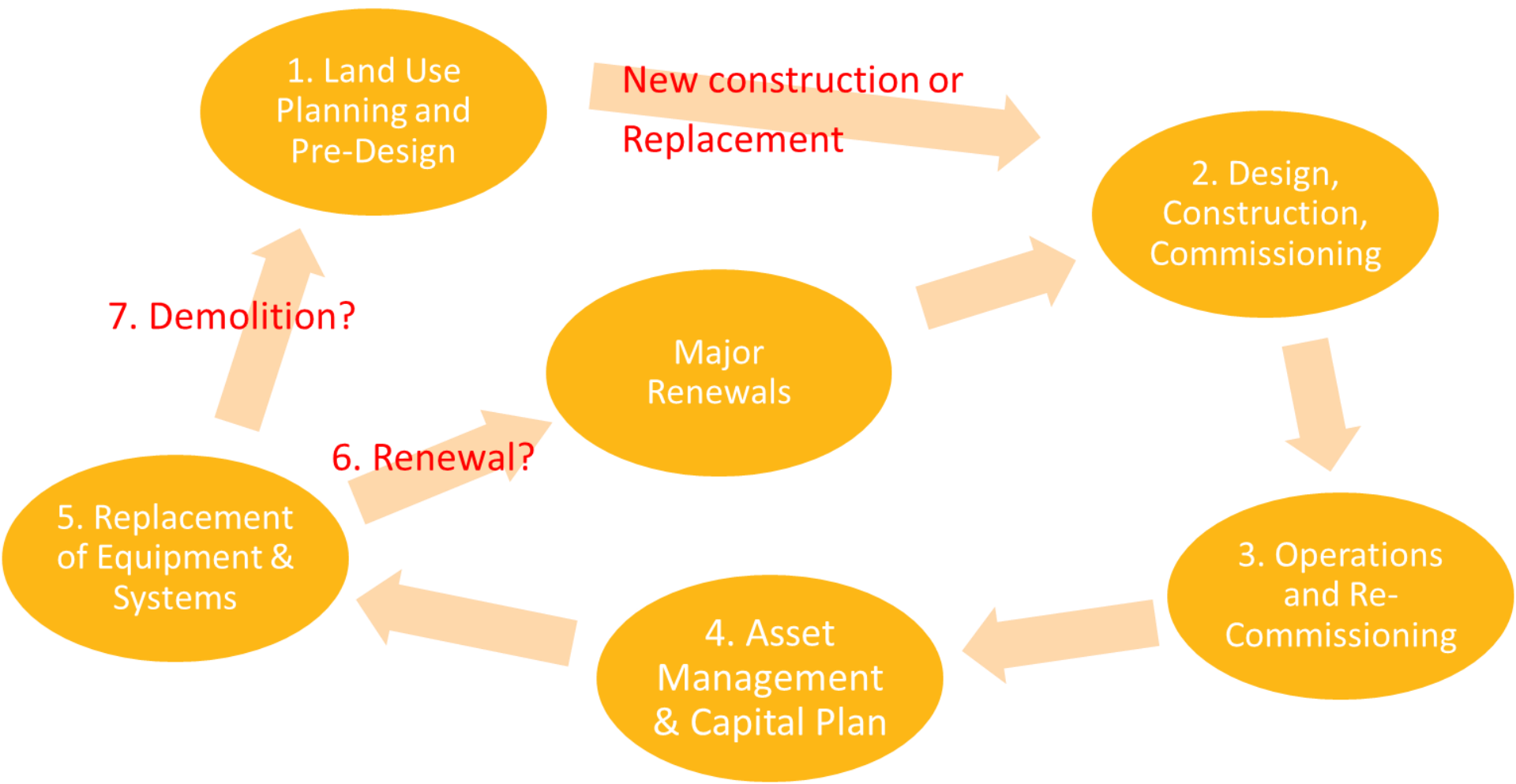
3. Allocate Jurisdictional and Institutional Responsibility



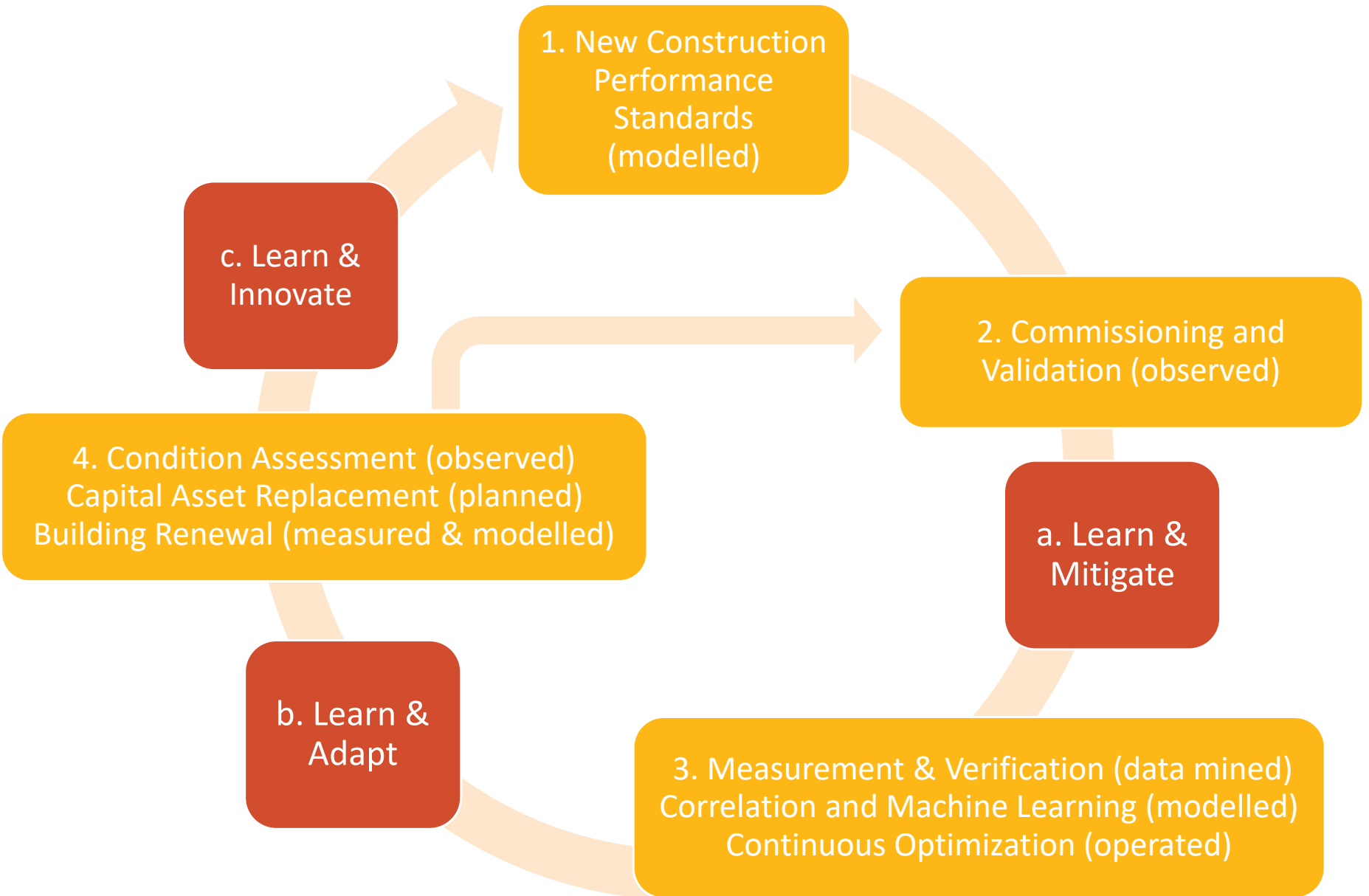
Relative Impact of Policies on Target Audiences



4. Leverage Building Lifecycle Investment Triggers



5. | Facilitate Data-driven, Outcome-based Policy



Questions for Panelists

1. What is your advice to government to achieve a resilient, zero-carbon and ultra-low energy building sector between now and 2050?
2. Which of the five draft Roadmap principles is the most important to catalyze market transformation and maximize benefits, regardless of government ideology and political stripe?



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