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Renovating Regulation to Electrify Buildings: A Guide for the Handy Regulator

Webinar

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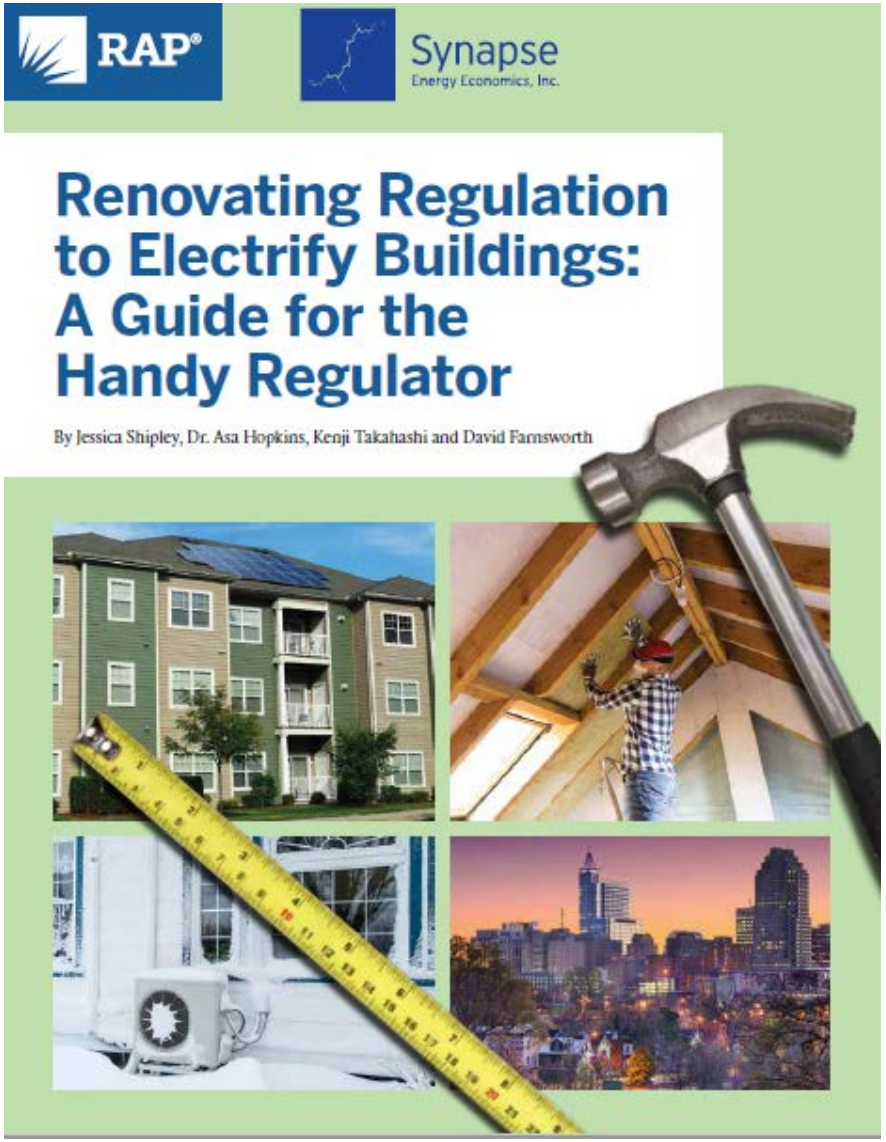
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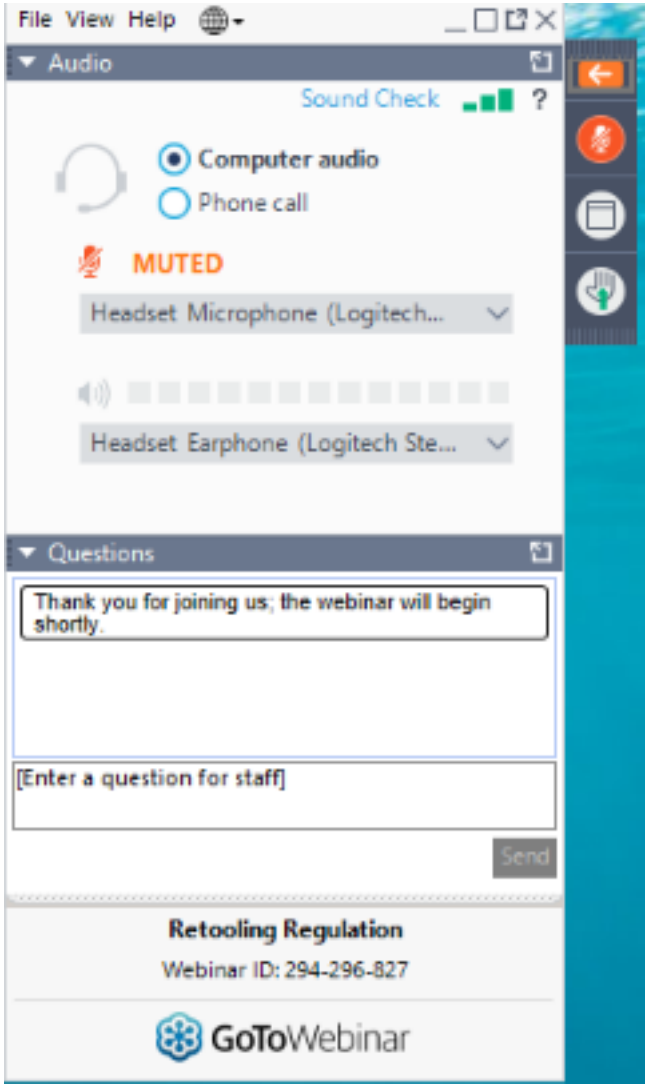
Renovating Regulation to Electrify Buildings: A Guide for the Handy Regulator
By Jessica Shipley, Dr. Asa Hopkins, Kenji Takahashi and David Farnsworth

Questions?

Please send questions through the Questions pane



Our Experts

Jessica Shipley

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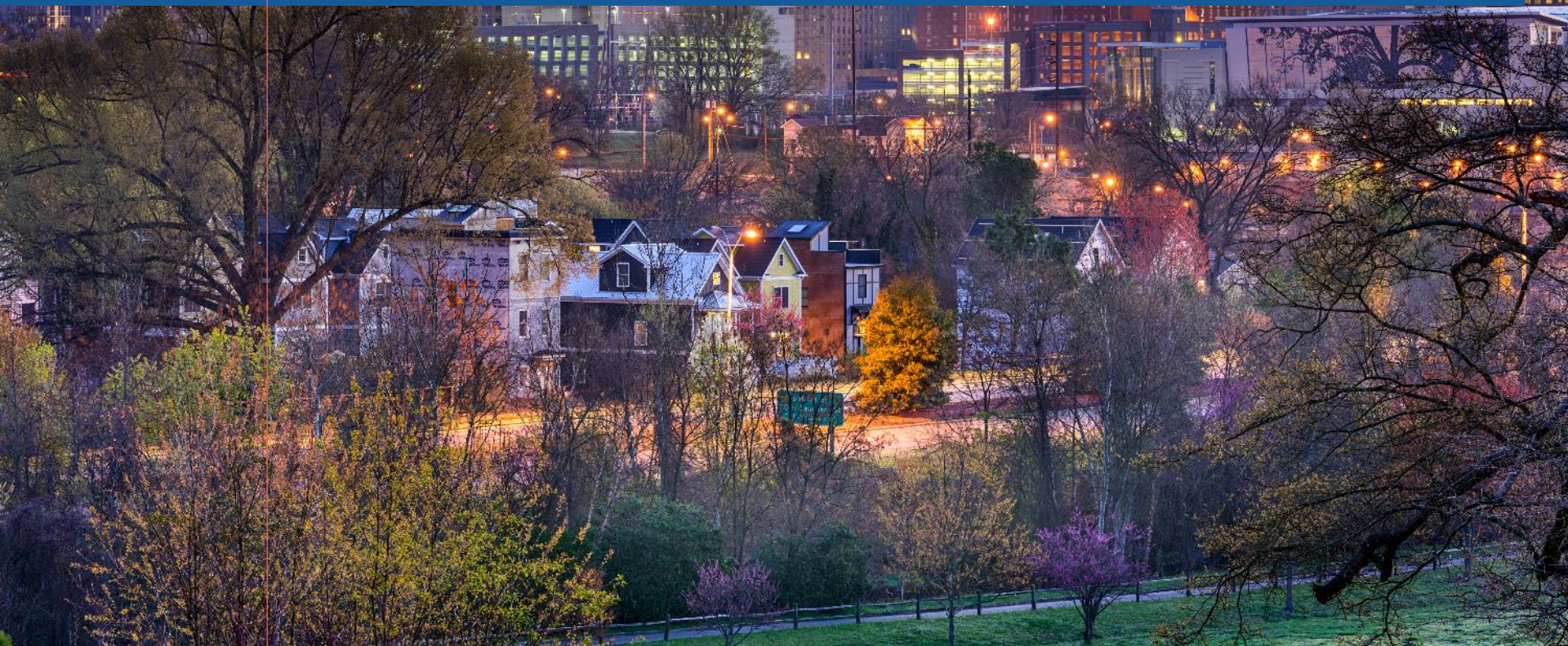
1 Context



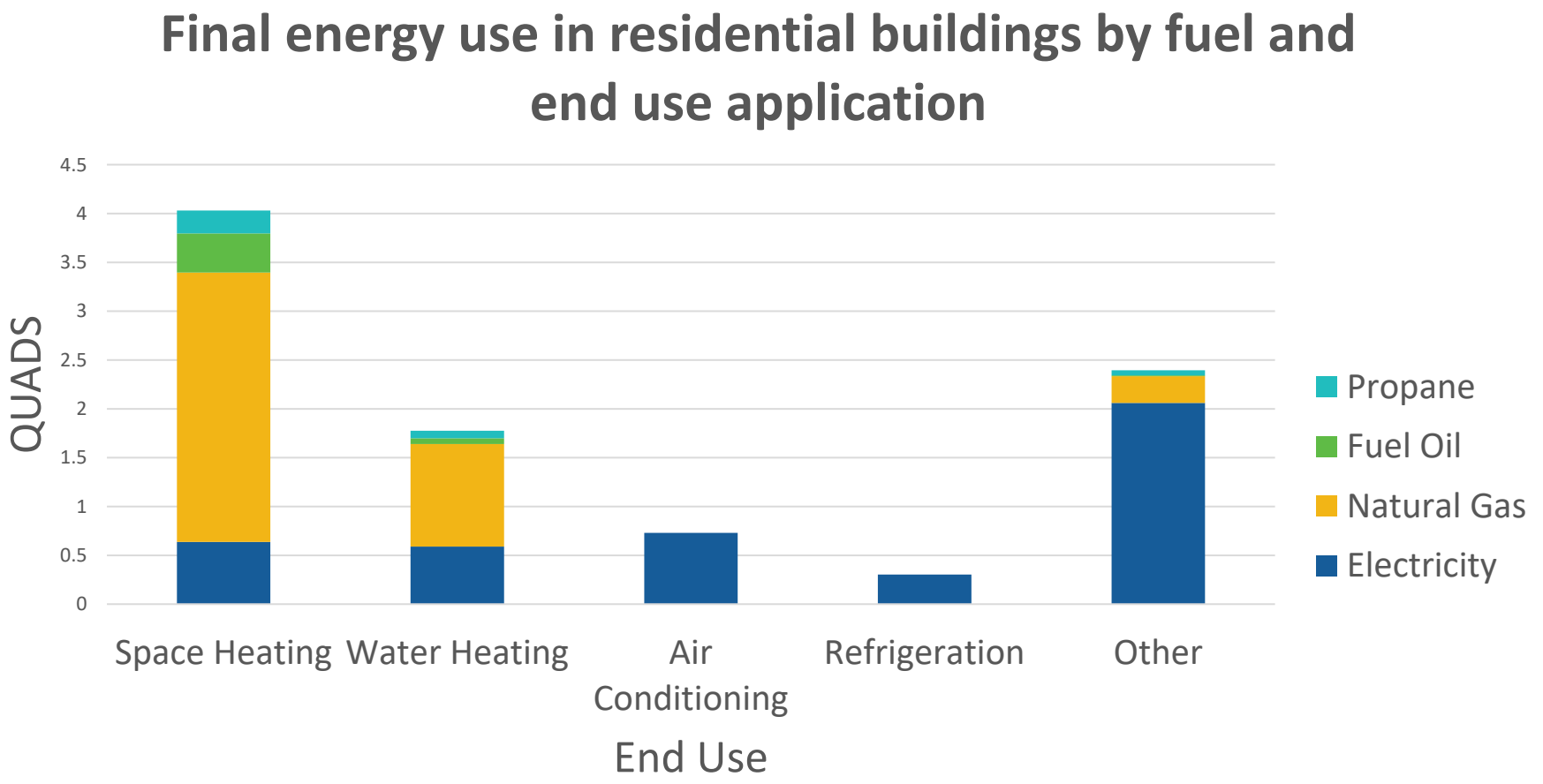
Status Quo: Inherited Policies

While many technologies and the policies supporting them have served us well in the past …

Regulation Needs Renovation

… new policy priorities and technologies are driving a need for change.

Fossil Fuels Still Dominate Space and Water Heating



Source: EIA's Residential Consumption Survey (RECS) 2015

The Opportunity

- Efficient, clean, and controllable – cost-effective electric end-use technologies installed in US buildings will produce benefits:
  - Cost savings
  - Grid flexibility
  - Lower emissions

The Challenge

- Can regulatory frameworks evolve to enable greater electrification?
- Barriers exist in both regulation and policy:
  - Will hard-to-serve consumers benefit?
  - What should energy efficiency policy & programs look like?
  - Should fossil gas systems continue to expand?
  - How will customers and utilities benefit from flexible building loads?

2 Equitable Building Electrification

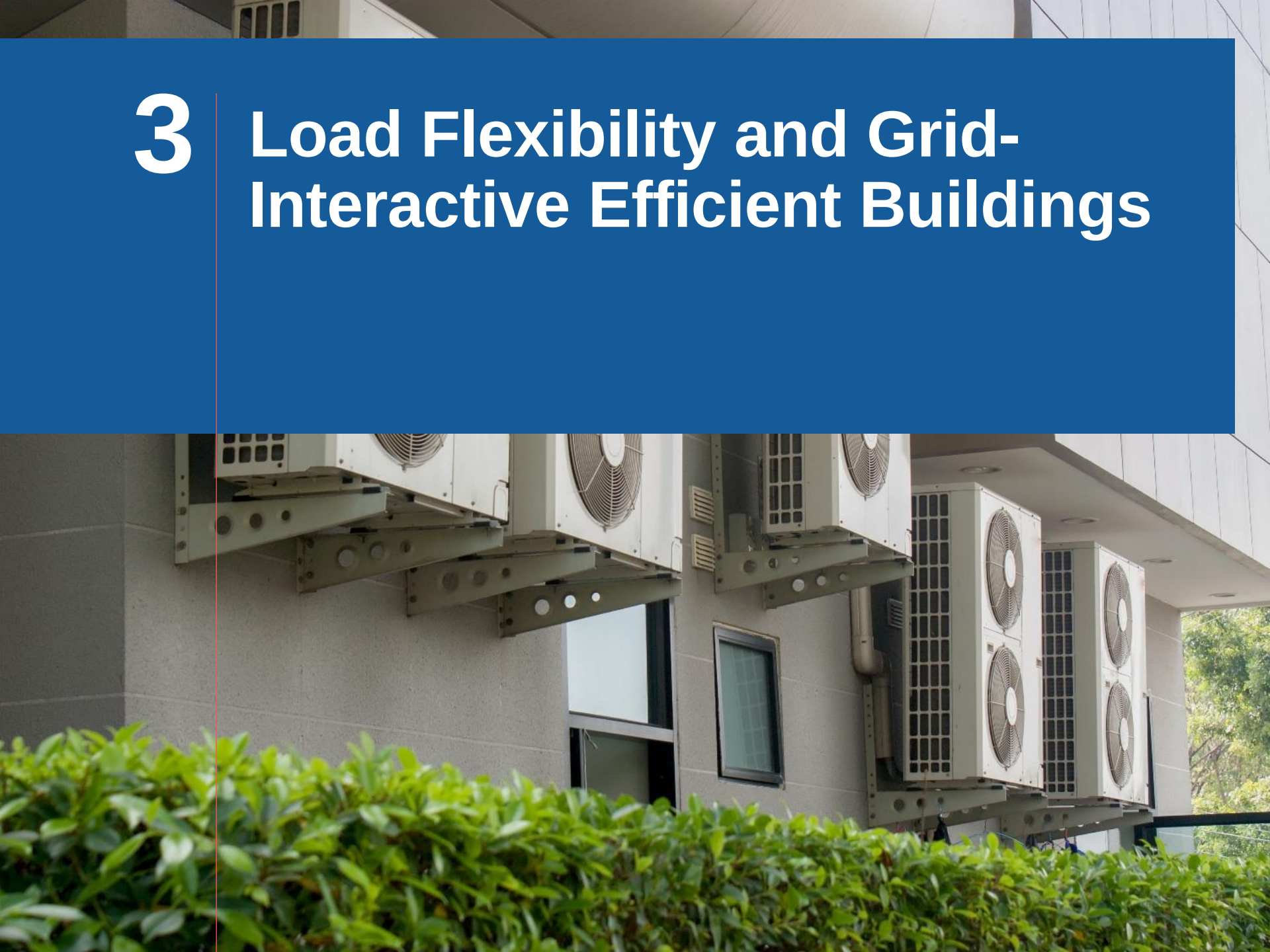
Lay of the Land: Access

- Ensure that all consumers get access to the benefits of building electrification
  - The public is not a monolith
- Persistent barriers exist throughout energy regulatory structures
  - The "…**and** equity" problem
  - Reaching out: Regulators could benefit from additional knowledge and insight into hard-to-reach communities
  - PUC processes could be more accessible to non-experts

A Renovation Toolkit

- Get a better handle on how well existing programs and policies are working
- Reassess and improve programs regularly
- Improve opportunities for meaningful engagement in policymaking and regulation
- Intentionally design more effective building electrification programs to recognize the needs of a diverse public

3 Load Flexibility and Grid-Interactive Efficient Buildings



Buildings as Grid Resources

Efficient
Persistent low energy use minimizes demand on grid resources and infrastructure.

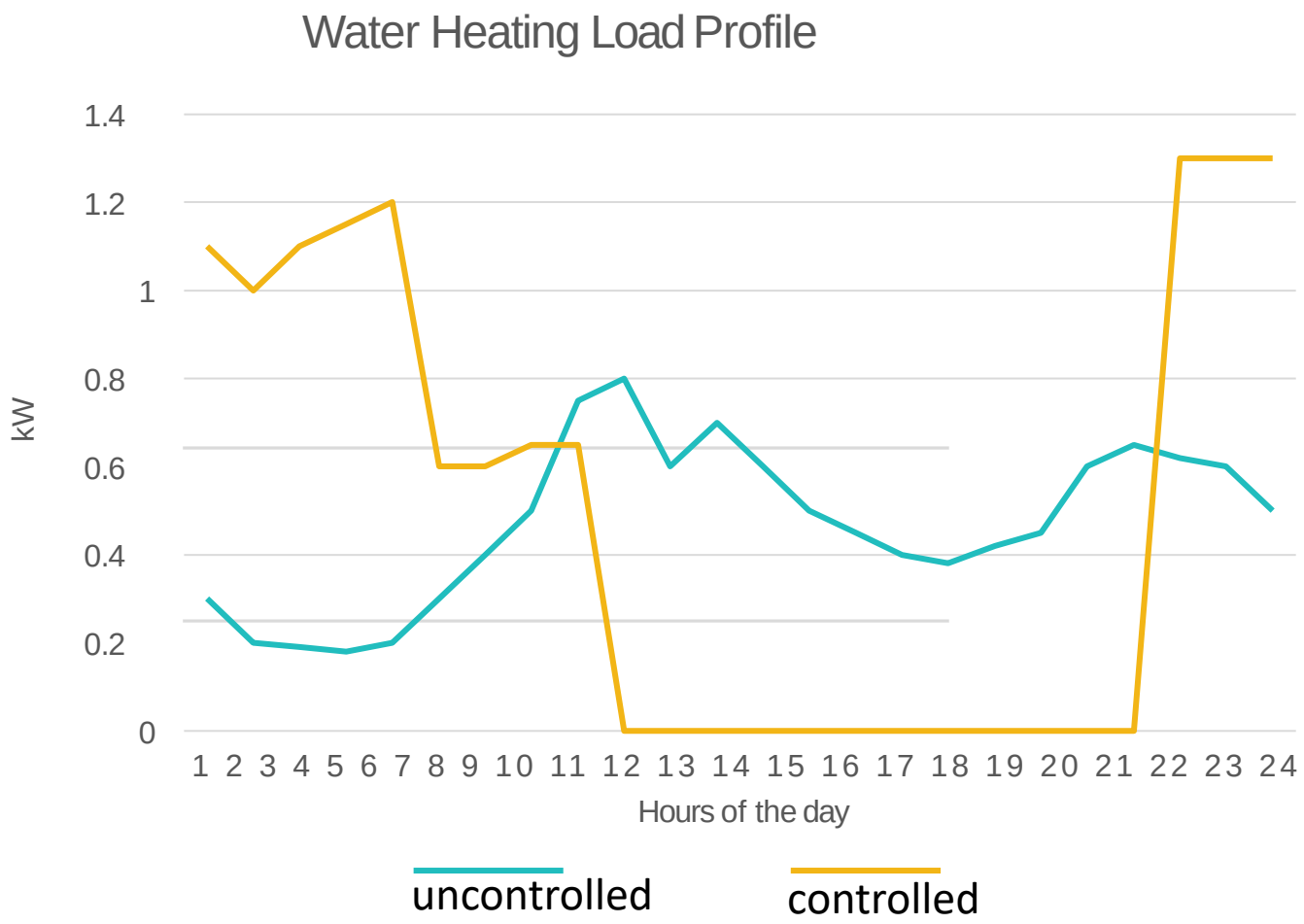
Connected
Two-way communication with flexible technologies, the grid and occupants.

Smart
Analytics supported by sensors and controls co-optimize efficiency, flexibility and occupant preferences.

Flexible
Flexible loads and distributed generation/storage can be used to reduce, shift or modulate energy use.

Source: Neukomm, M., Nubbe, V., and Fares, R. (2019). Grid-Interactive Efficient Buildings.

What is Load Flexibility?



Challenges and a Renovation Toolkit

Need better articulation of the value of flexibility

- Use pilots to illuminate the various value streams in utility service territories

Traditional regulation disincentivizes utilities from pursuing load flexibility

- Address throughput incentive and capital bias

Utility rate designs dull consumer awareness and prevent realization of value

- Structure rates to communicate the system value of flexibility

Utility planning fails to recognize flexible buildings as a resource

- Incorporate flexible buildings as a resource into long-term planning

4 Rate Design

Key Concepts and Renovations Needed

1. Time-differentiated energy charges are needed for the economics of building electrification

Oklahoma Gas & Electric: Variable Peak Pricing

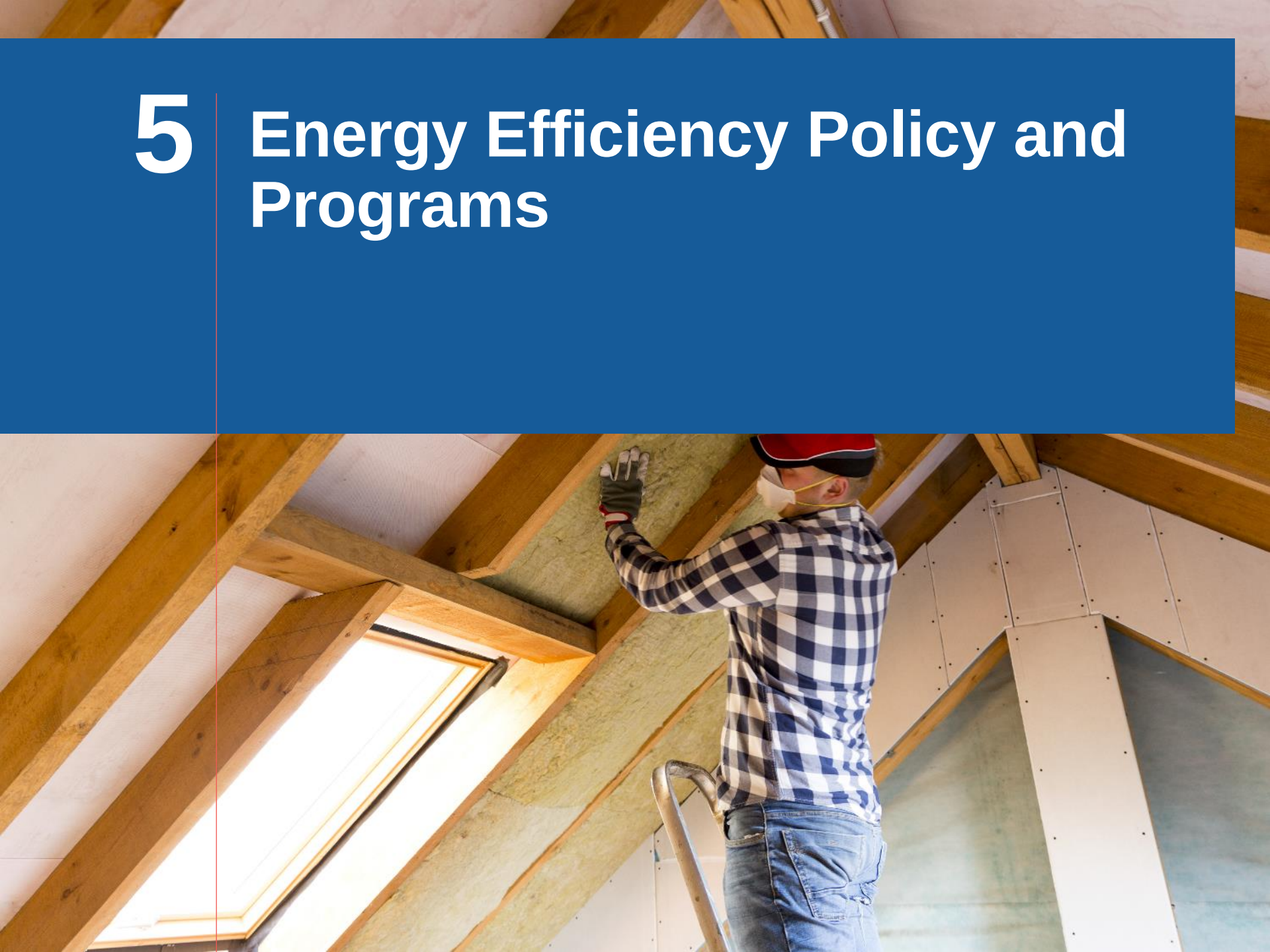
Customer Charge ($/month)	$13.00

Off-Peak (cents/kWh)	3.27
On-Peak (2-7 pm) (cents/kWh)	
Low	3.27
Standard	7.70
High	18.40
Critical	38.00

Key Concepts and Renovations Needed

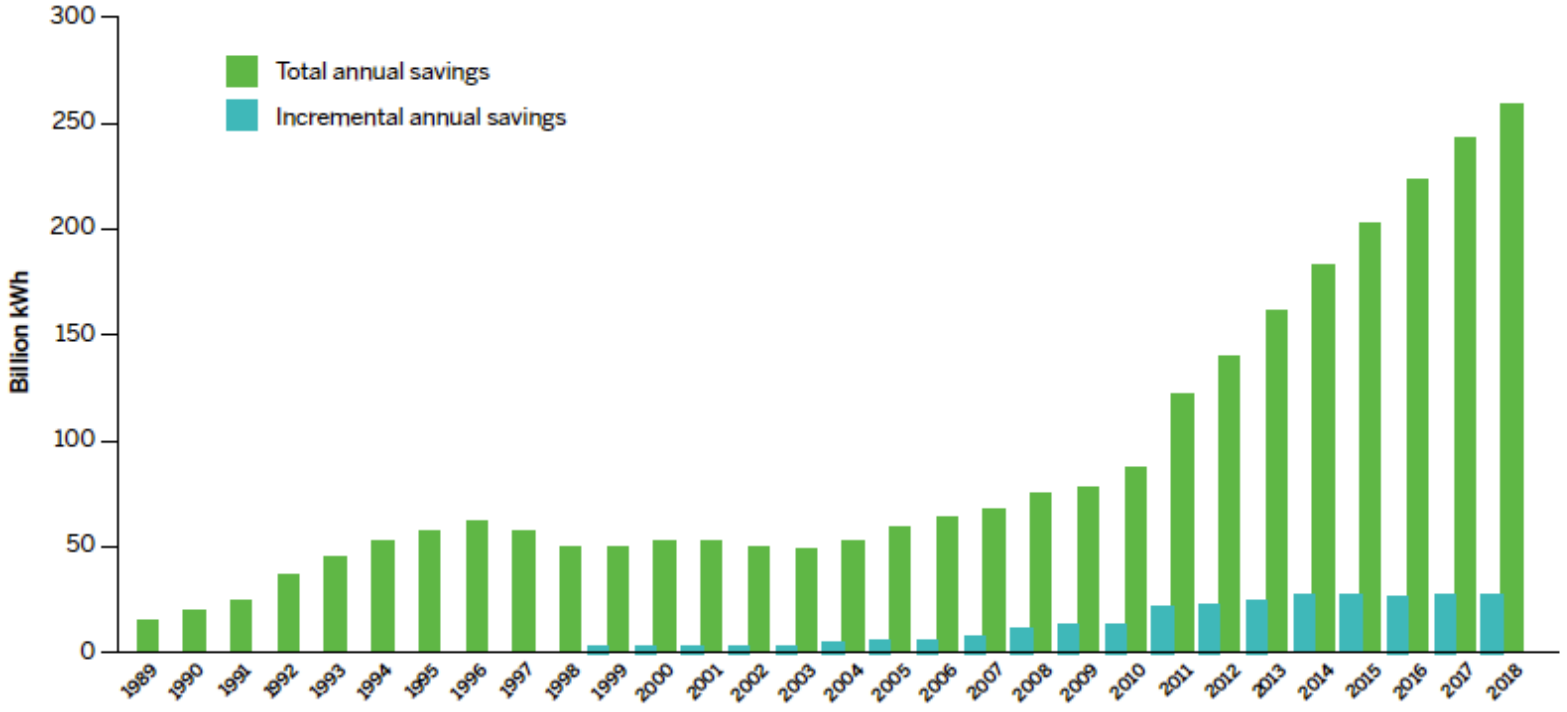
2. Shift recovery of gas utility costs away from fixed charges to make electrification more feasible, particularly for low-income customers
3. Evaluate electric bill riders and consider making them time differentiated

5 Energy Efficiency Policy and Programs



Lay of the Land

Electricity savings from ratepayer-funded efficiency programs



Source: Berg, W., Vaidyanathan, S., Junga, E., Cooper, E., Perry, C., Relf, G., Whitlock, A., DiMascio, M., Waters, C., and Cortez, N. (2019). *The 2019 State Energy Efficiency Scorecard*

Challenges and a Renovation Toolkit

Traditional Energy Efficiency Resource Standards hinder fuel-switching (e.g. electrification)

- Replace existing policy targets with fuel-neutral goal

Many state EE policies prohibit using program funds for fuel-switching

- Remove fuel-switching prohibitions

Few EE programs offer building shell improvements with other EE measures

- Where appropriate, evaluate building weatherization with electrification

Current cost-benefit frameworks may not be appropriate

- Explore new methods to evaluate electrification programs and activities

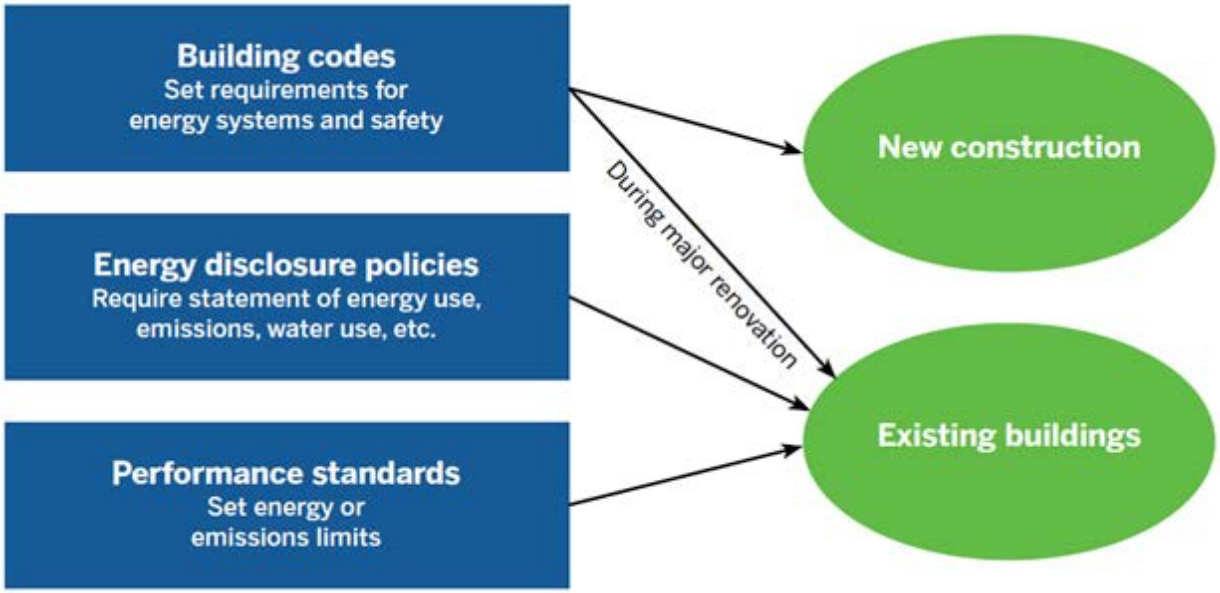
6 State and Local Building Regulations

Lay of the Land: Barriers to Electrification

- Lack of information on baseline energy use and emissions
- Lack of information and familiarity with electrification technologies
- Split incentives between owners and renters

A Renovation Toolkit

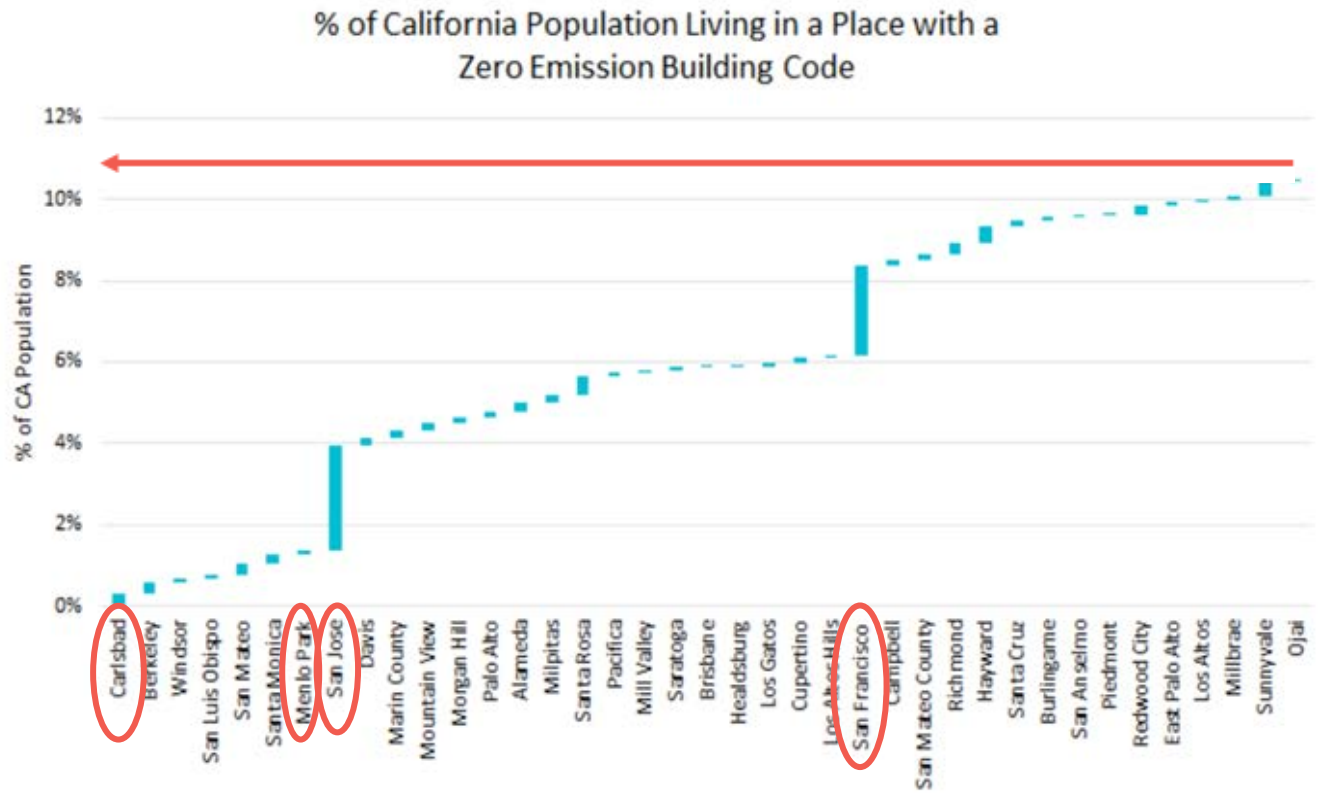
- Municipal or state governments can use regulatory tools for new and existing buildings



Electrification or “Net Zero” Building Codes

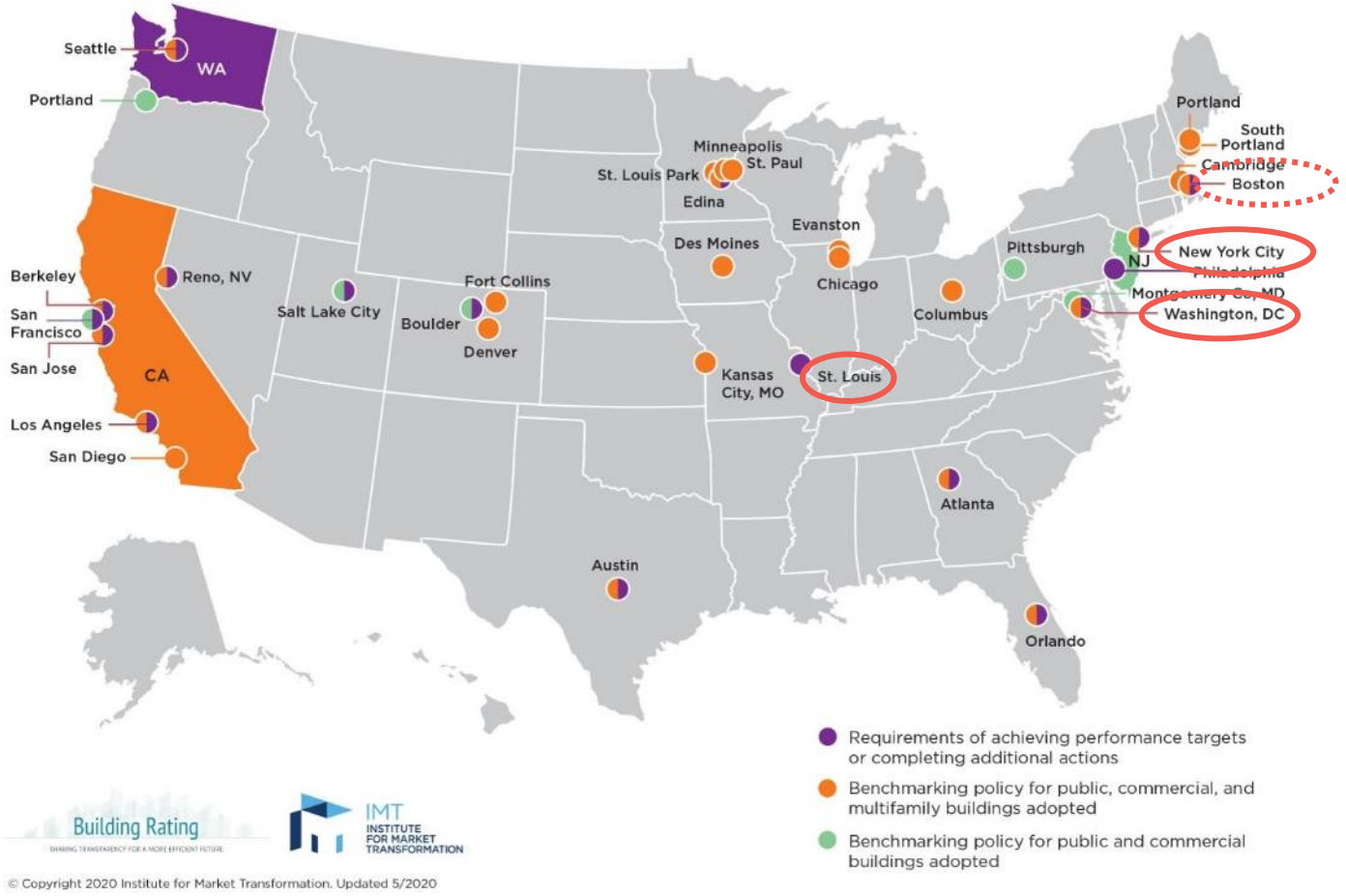
- Adopt “electrification friendly” building codes for new buildings
  - Electrification codes: All-electric codes, electric preferred codes and electrification-ready codes
  - Net-zero energy (NZE)/emissions codes
- Three pathways
  - NZE/electrification codes as minimum codes by state or local governments
  - Statewide stretch code
  - Local reach codes

Example: CA Local Electrification Codes



Source: Sierra Club (2020). California's Cities Lead the Way to a Gas-Free Future. https://www.sierraclub.org/articles/2020/12/californias-cities-lead-way-gas-free-future

Energy Benchmarking & Energy/Emissions Building Performance Standards



Source: Institute for Market Transformation (2020). Map: U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency and Beyond. https://www.imt.org/resources/map-u-s-building-benchmarking-policies/

Boston Building Performance Standards

Draft regulation

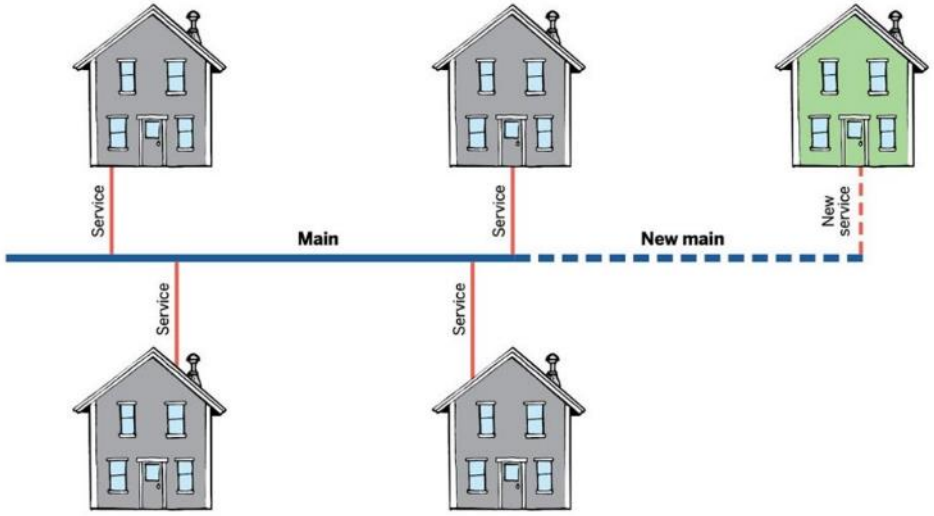
Building type	Emissions threshold (kgCO2e/SF)					
	2025	2030	2035	2040	2045	2050
Assembly	7.8	4.6	3.3	2.1	1.1	0.0
College/University	10.2	5.3	3.8	2.5	1.2	0.0
Education	3.9	2.4	1.8	1.2	0.6	0.0
Food Sales & Service	17.4	10.9	8.0	5.4	2.7	0.0
Healthcare	15.4	10.0	7.4	4.9	2.4	0.0
Lodging	5.8	3.7	2.7	1.8	0.9	0.0
Manufacturing/Industrial	23.9	15.3	10.9	6.7	3.2	0.0
Multifamily housing	4.1	2.4	1.8	1.1	0.6	0.0
Office	5.3	3.2	2.4	1.6	0.8	0.0
Retail	7.1	3.4	2.4	1.5	0.7	0.0
Services	7.5	4.5	3.3	2.2	1.1	0.0
Storage	5.4	2.8	1.8	1.0	0.4	0.0
Technology/Science	19.2	11.1	7.8	5.1	2.5	0.0

Source: Synapse Energy Economics (2020). City of Boston Carbon Emissions Performance Standard – TAG Meeting #6: Results of Technical Advisory Process.

7 Gas Utility Network Extensions

Lay of the Land

- Principles:
  - Try to avoid unnecessary costs
  - Align costs and benefits
- The cost of new gas service is partly socialized



Context has changed, so policies are out of alignment with principles

- Gas is not necessary to provide cost-effective heating service
- Cost recovery math based on use over 50+ years

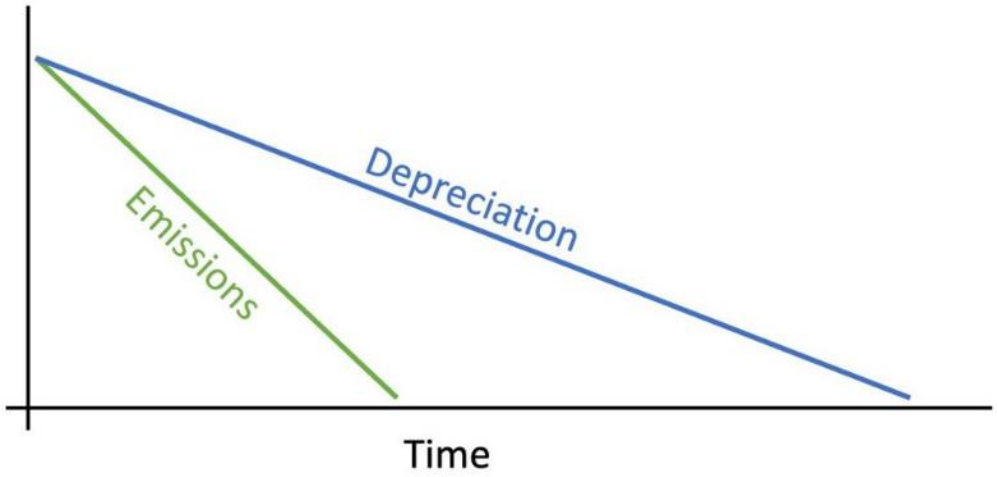
A Renovation Toolkit

Need

- Consider updating the gas utility's obligation to serve
- Conduct robust gas infrastructure planning, informed by policy goals

Cost

- Update the calculation of "economic" line extensions
- Allow electric utility to socialize electrification costs?
- Consider adding a social cost of GHG emissions



Coming Back to Equity

- Equity should be a key consideration for regulators examining the future of gas
  - *Between customers:* Customers should pay in proportion to how much they benefit from the system
  - *Over time:* Shifting costs to the future is not equitable
- Low-income customers and renters face barriers to electrification
- Customers who electrify more slowly will bear an unfairly higher cost, unless regulators:
  - Update how gas assets are paid for
  - Avoid building unnecessary new gas infrastructure

8 Takeaways

Key Points

- Regulatory frameworks need to evolve to enable the benefits of building electrification

- Barriers exist in regulation and policy, but so do options for decision-makers to take action immediately