Opportunities and Actions to Accelerate the Transformation to an Efficient and Renewable Energy World

Steven Nadel, Executive Director

Presentation to ASES

June 2020

ACEEE
American Council for an Energy-Efficient Economy

- Non-profit research organization
- Founded in 1980
- 60 staff and US $10 million/year budget
- Act as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors
- Funding comes from foundations, government agencies, contracts, conferences and corporate memberships

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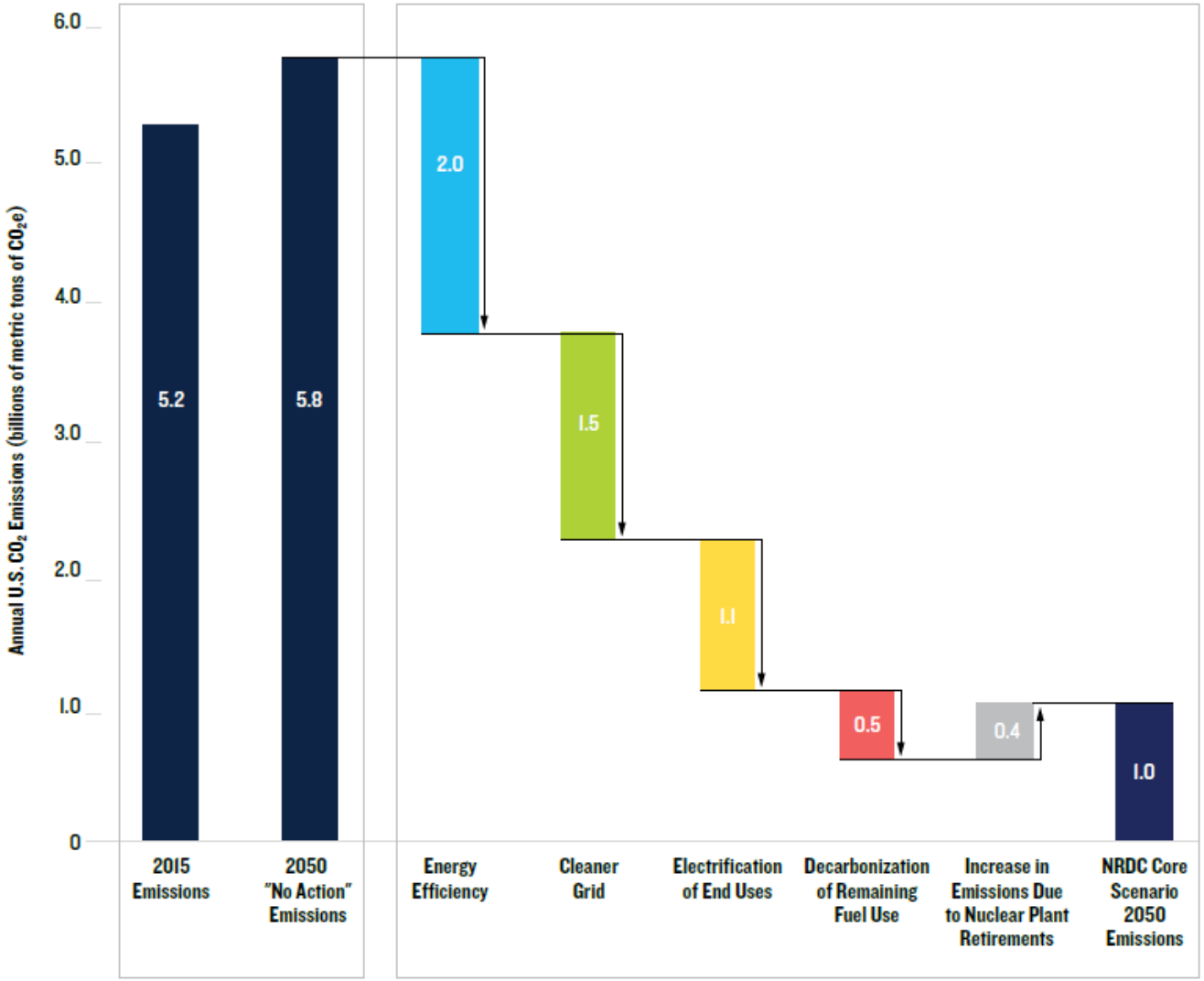
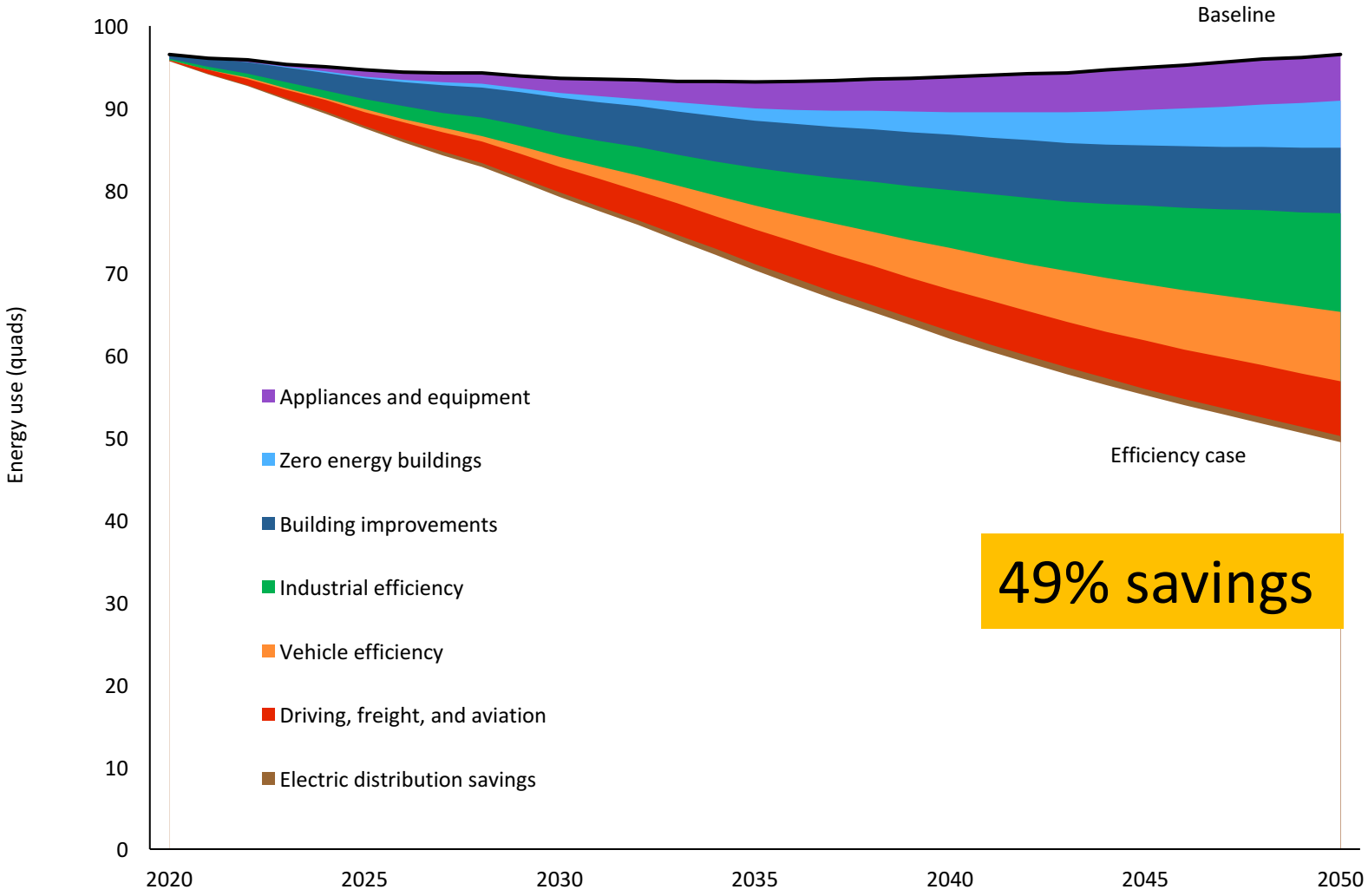
America's Clean Energy Frontier



Source: NRDC, 2017

Opportunity Analysis: Energy Savings



Source: ACEEE, 2019, *Halfway There*

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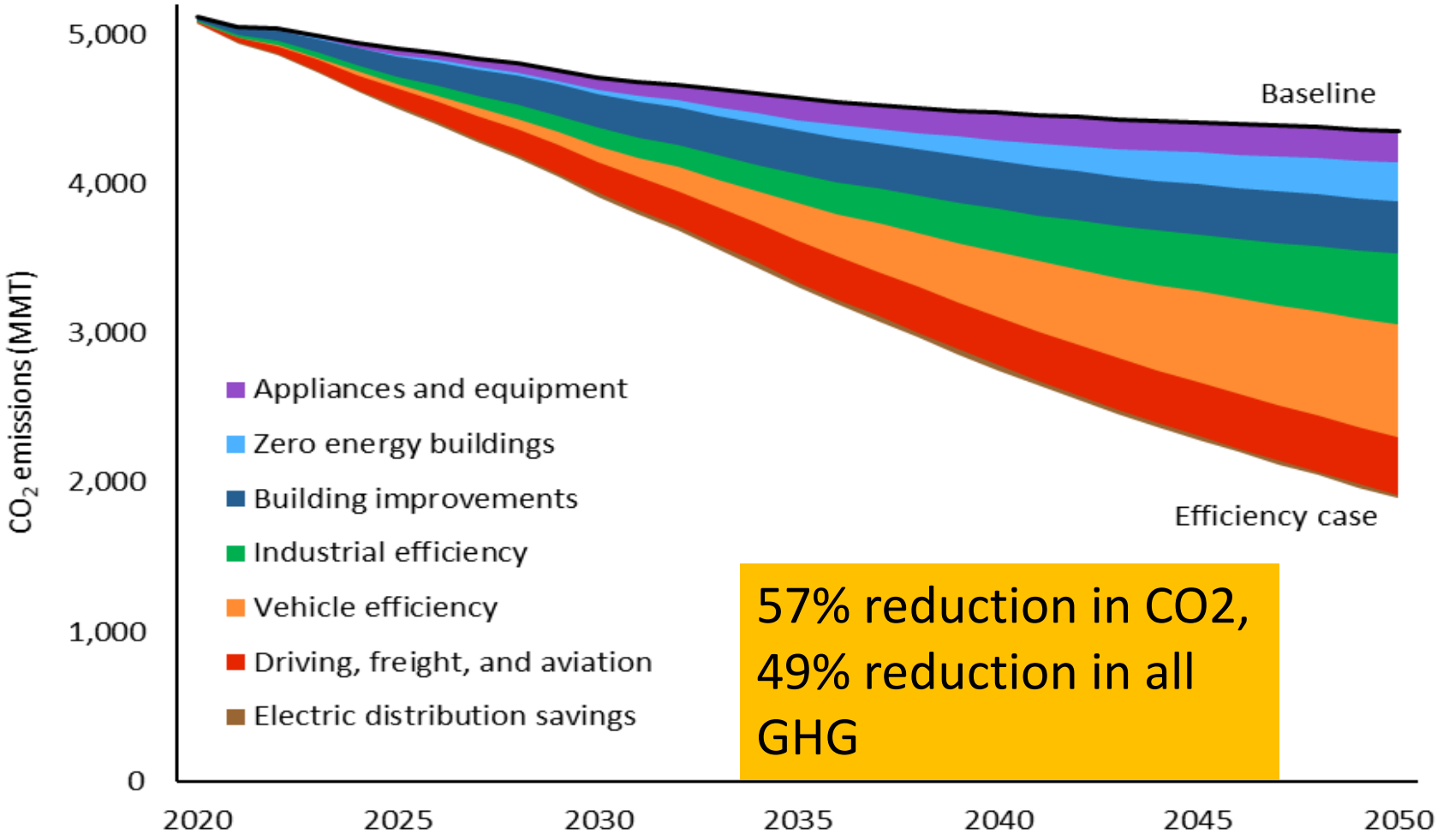
Opportunity Analysis: Emissions Reductions



Source: ACEEE, 2019, *Halfway There*

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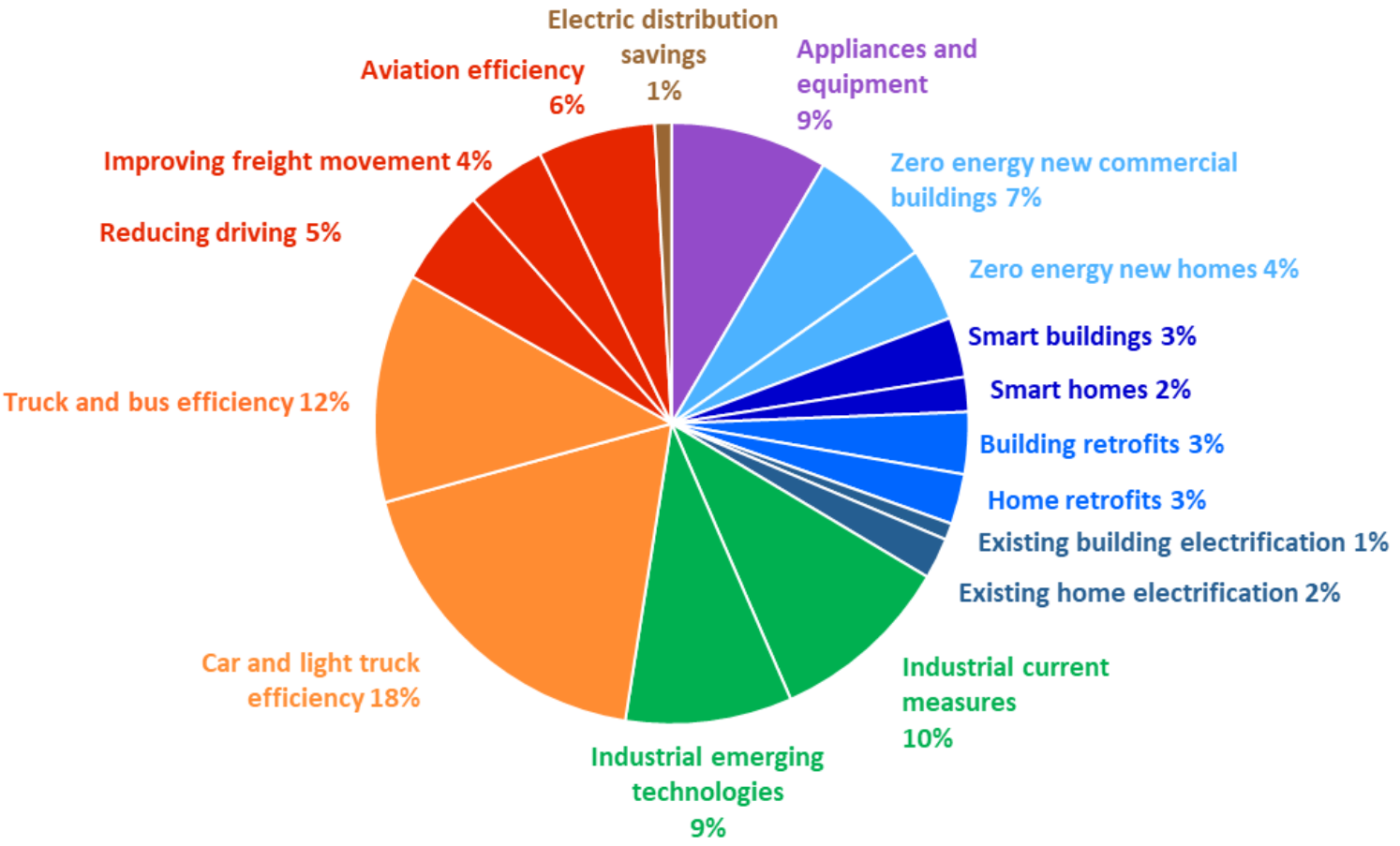
Allocation of Emissions Reductions by Opportunity



Efficiency Critical; Will be Challenging to Hit Climate Goals without Efficiency

- Efficiency lowers total cost
  - **Consumers**
  - **The grid**
- Efficiency can help reduce peak demand
- Efficiency has additional benefits beyond energy and climate
  - **Comfort**
  - **Health**
  - **Productivity**
  - **Resilience**

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Zero Energy/Carbon New Homes & Buildings

- Efficient design of new homes and commercial buildings (zero energy ready) and use of renewable electricity to meet average annual loads.
- Most of these buildings are all or mostly electric
- Need voluntary programs to promote ZEBs (includes state & local govts. leading by example)
- Reach codes for leading jurisdictions

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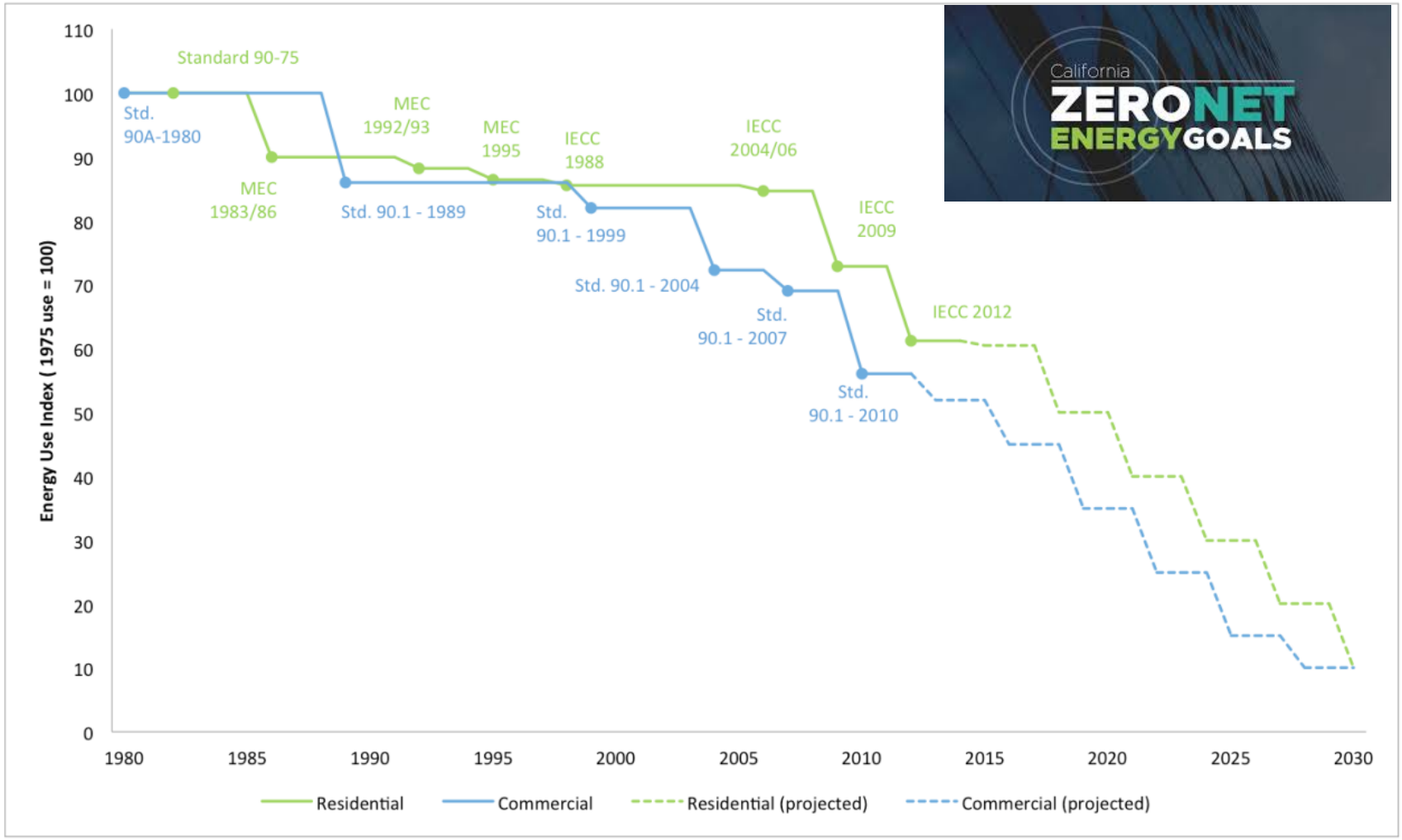
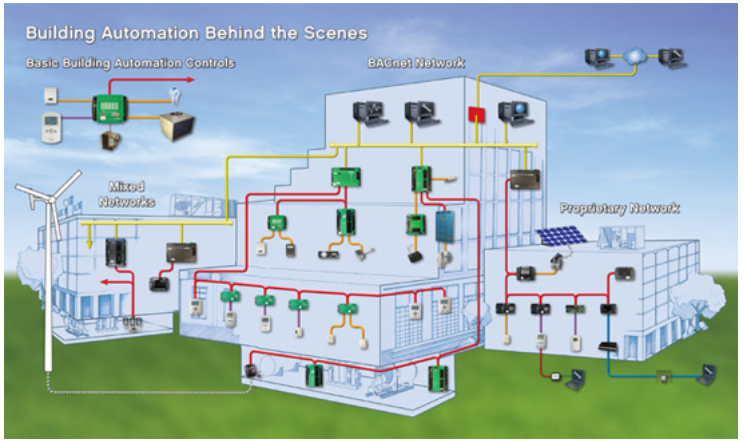
Building Code Progress

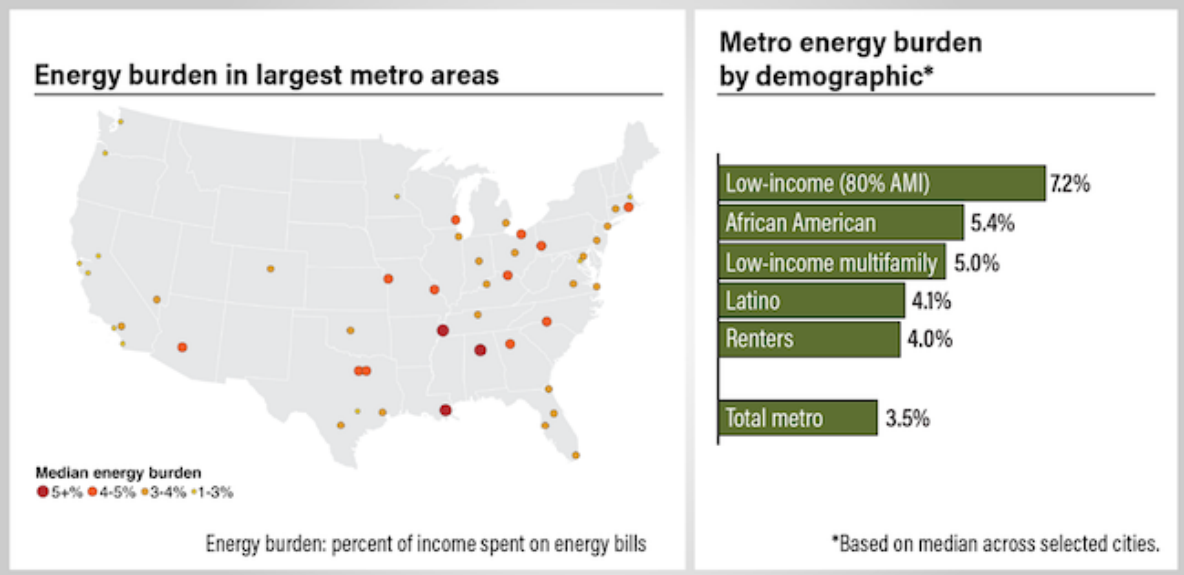


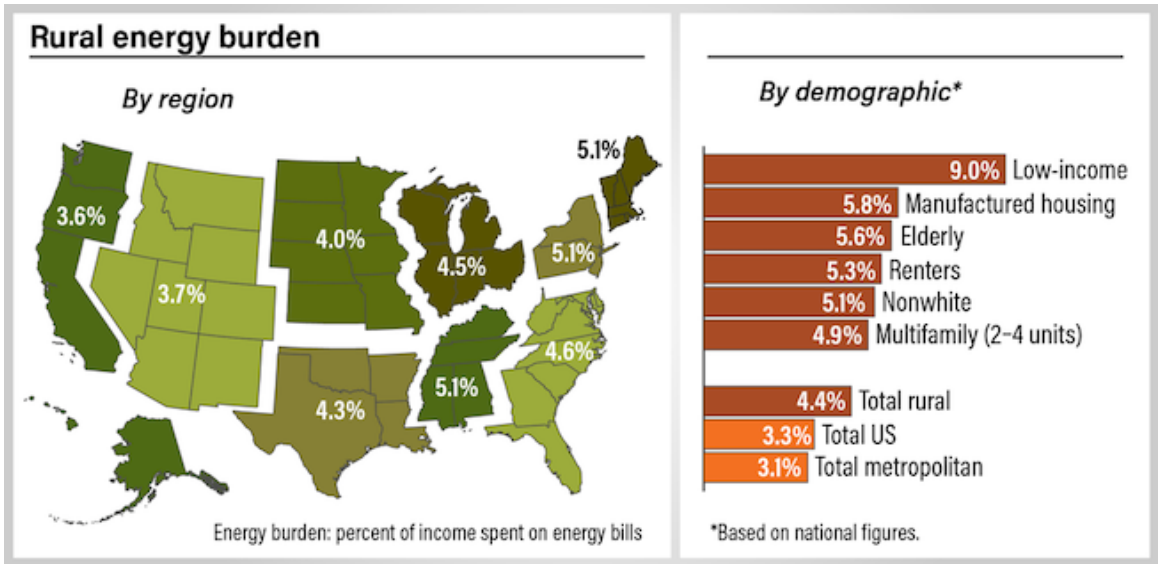
Upgrades to Existing Buildings & Homes

- Energy efficiency upgrades and smart control technologies; electrification of remaining loads.



Addressing Equity Critically Important





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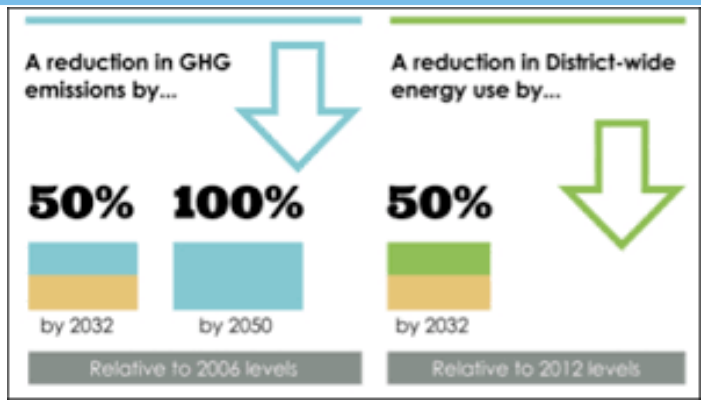
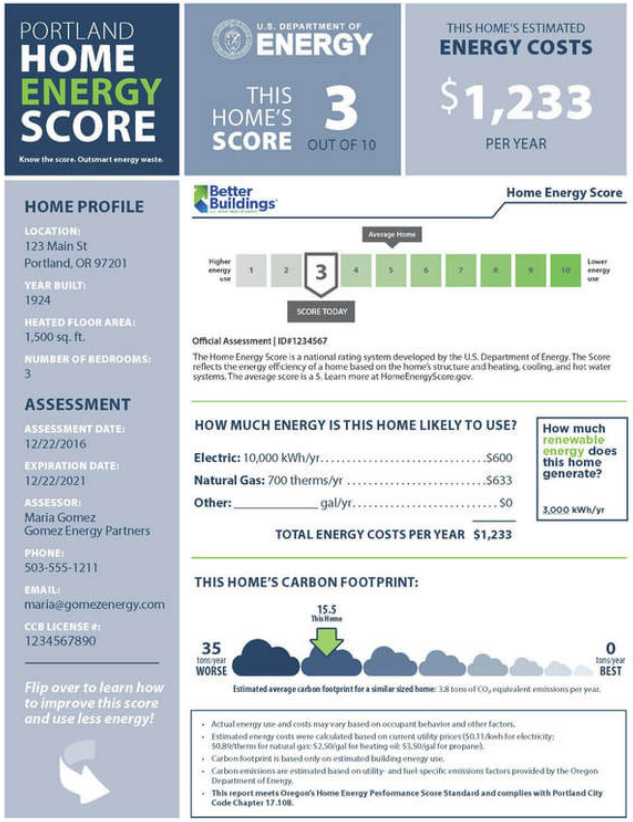
Mandatory Building Performance Targets



- Commercial targets in NYC, DC, WA, Tokyo, Reno, St. Louis and the Netherlands
- Targets for rentals in Boulder (earn 100 pts) and UK (at least “E”)
- France has residential standards to require “E”
- Other jurisdictions in US and Canada considering
- Tokyo, Boulder, UK, Reno and the Netherlands being implemented; rest working out details
- Most based on energy use but NYC uses GHG and Boston and Cambridge leaning toward GHG
- Activists can advocate at state and local levels

Other State and Local Policies to Promote Retrofits

- Building and home benchmarking and labeling (e.g. time-of-sale home energy reports in Portland, Berkeley and Austin.
- Energy audit, retrocommissioning and lighting upgrade requirements.
- Job training, weatherization programs
- Advocacy on utility programs



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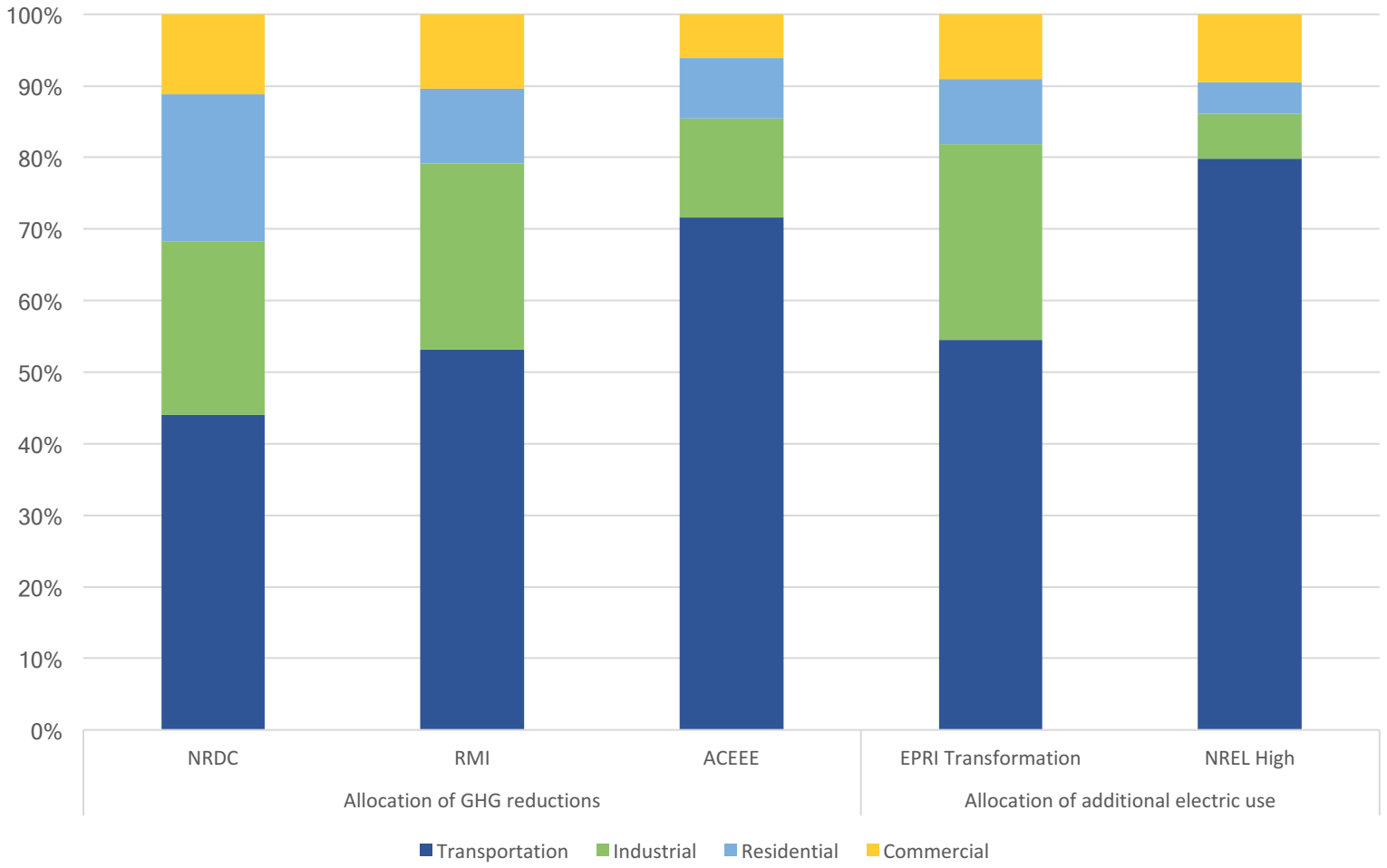
Allocation of Electrification Potential



Source: Nadel, ACEEE, Oct. 2019 blog looking at studies by NRDC NREL, EPRI, RMI and ACEEE

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Markets for Electrification

Sector	Good Markets Today/Soon	Very Challenging
Transportation	Many passenger vehicles; delivery trucks and buses emerging	Long-distance trucking and aviation
Residential	New construction, homes with oil and propane heat, homes with natural gas in warm climates, homes adding AC	Supplemental heat in very cold regions, such as Minnesota
Industrial	High-value process applications such as UV and IR coatings; induction melting	High temperature bulk processes such as chemical and petroleum

Note: Not enough info available yet to characterize commercial sector.

Programs and Policies to Promote Electrification

- Allow utilities to fund “beneficial” fuel switching
- Incentive programs
- Restrictions on use of fossil fuel equipment (many Calif. communities, Brookline Mass.)
- Limit expansion of natural gas distribution grid
- R&D to improve equipment and lower costs
- Price on carbon (portion of proceeds can fund programs)

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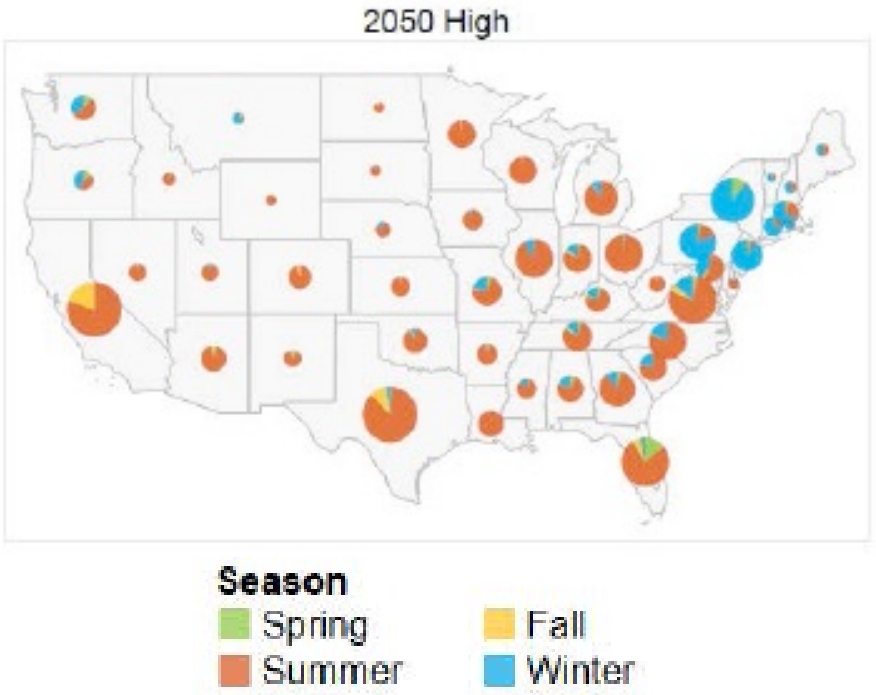
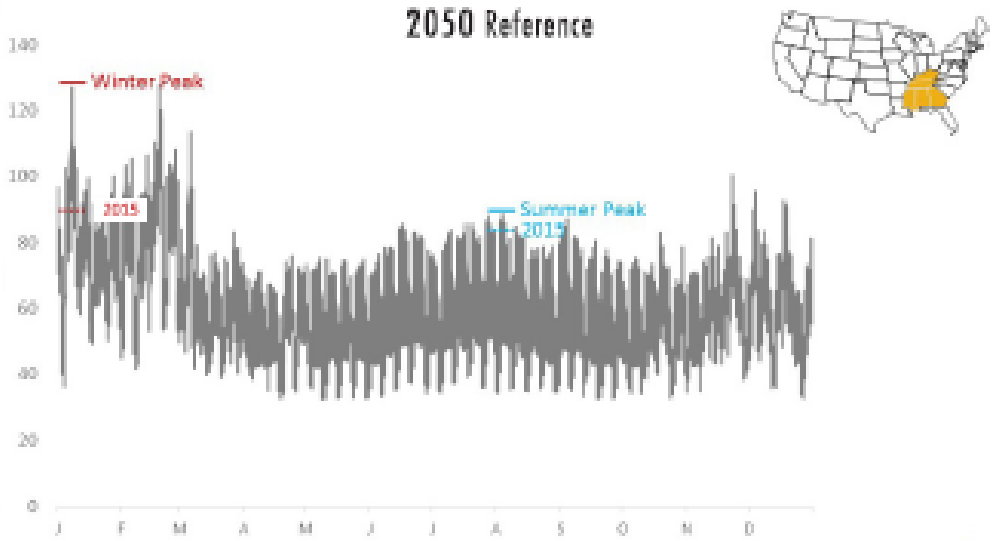
Peak Loads in 2050 in Electrification Scenarios



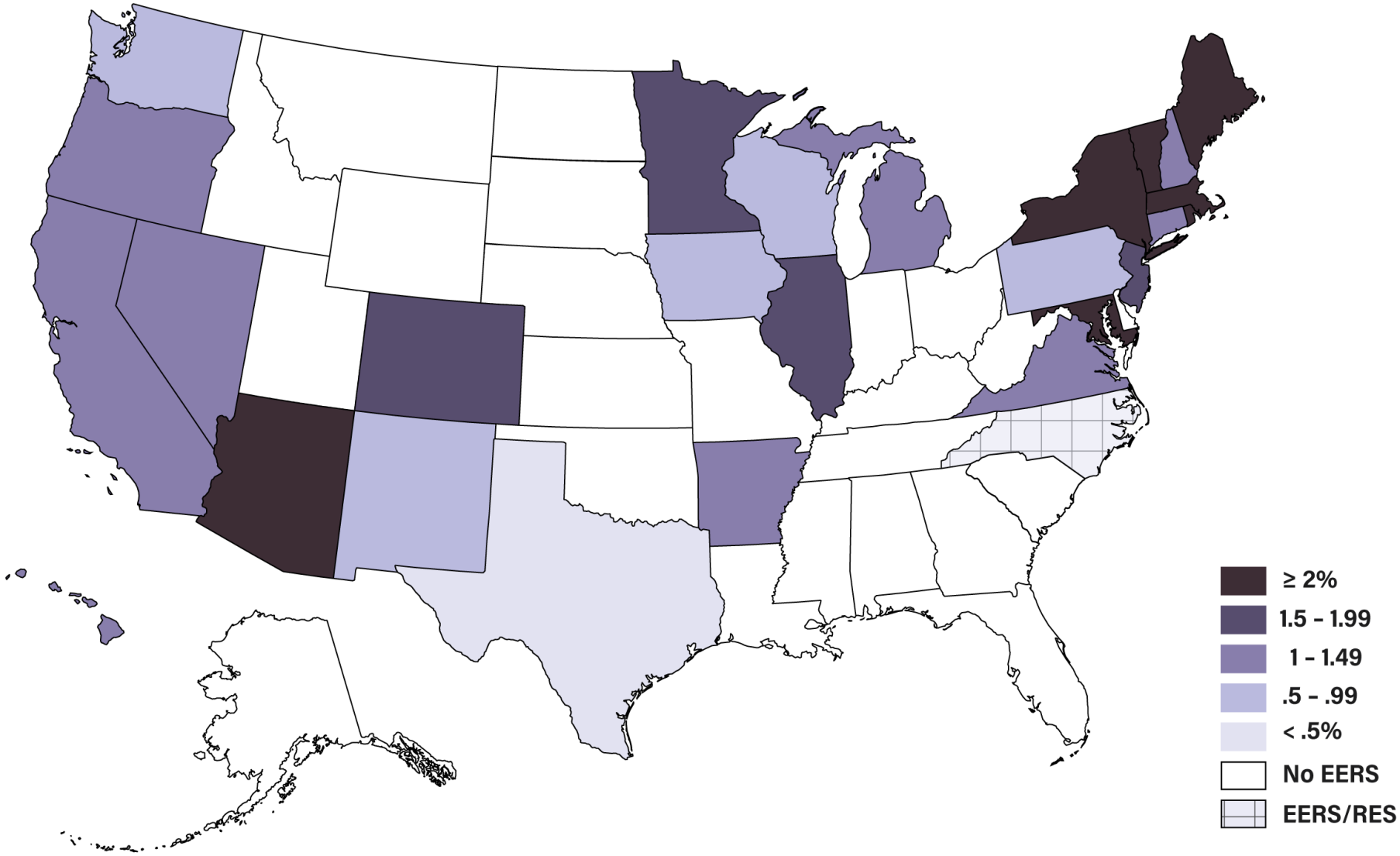


For Southeast

Sources: Mai et al., NREL, 2018 (left) and EPRI 2018 (right)

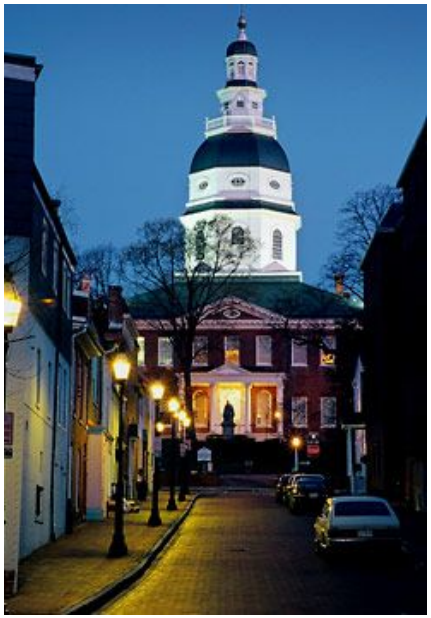
State Energy Efficiency Resource Standards

(in % of sales that need to be saved annually)



State and Local Policy Resources

- Governor's Energy Toolkit: www.aceee.org/topic-brief/governors-ee-toolkit
- Local policy toolkits: www.aceee.org/local-policy-toolkit



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Conclusion

- We can slash greenhouse gas emissions, getting roughly halfway to our long-term energy and climate goals.
- Policies will be critical for reaching climate goals.
- There are many programs and policies activists can and should promote..

Contact Information

Steven Nadel

snadel@aceee.org

202-507-4011