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EMPOWERED: BRINGING ENERGY EFFICIENCY INTO LOW-INCOME HOMES

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Introduction

During a January 2018 cold spell, temperatures fell below zero degrees Fahrenheit across much of the Northeastern United States. For Howard Jerome, an eighty-three-year-old Vermont resident who relied on social security and pension payments to make ends meet, the frigid air in his home stung his nose and his pocketbook.[1] Jerome had received $400 from his utility's fuel assistance program that month, but he had already spent most of it in a single week just to keep his house tolerably warm.[2] Elsewhere in the state, Todd Alex, a disabled man who also lived on a fixed income, had already used up much of the kerosene he received through a local welfare program to heat his poorly-insulated trailer when the January storm's biting

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1. *See* Katie Zezima, *Low-Income Residents Struggle with High Heating Bills, Frozen Pipes as Frigid Temperatures Linger*, THE WASH. POST (Jan. 5, 2018), https://www.washingtonpost.com/national/low-income-residents-struggle-with-high-heating-bills-frozen-pipes-as-frigid-temperatures-linger/2018/01/05/bfa5018a-f251-11e7-b3bf-ab90a706e175_story.html?utm_term=.da55d3efa2b6.

2. *See id.*

gusts began pushing on his trailer's fiberglass walls.[3] Alex was unsure how he would survive if the cost of fuel were to go any higher.[4]

Each year, millions of low-income Americans like Jerome and Alex endure uncomfortable temperatures within their own homes and face agonizing decisions between paying electricity bills or buying food or other basic necessities. A major contributor to this problem is the reality that many low-income homes are inadequately insulated and lack other basic energy efficiency features that could potentially save residents hundreds of dollars per year in energy costs. Unfortunately, many existing government-supported energy-efficiency improvement programs are largely inaccessible to the low-income households that need them the most.

This Article highlights the disproportionate energy burdens on low-income households, identifies and analyzes barriers that currently prevent the placement of energy-efficiency improvements in many low-income homes, and advocates for specific policy strategies capable of leveraging energy-efficiency technologies to improve the lives of millions of low-income Americans. Part I of this article provides background information on energy-efficiency technologies and their ability to mitigate energy-related financial burdens, especially for low-income households. Part II examines the current landscape of energy-efficiency policies across the United States, with specific focus on those affecting low-income homes. Part III then highlights specific barriers to energy-efficiency investments for low-income households and advocates for specific policy strategies for improving the lives of Americans in low-income households through greater use of energy-efficiency technologies.

I. Energy Efficiency, Energy Burdens, and their Impact on Low-Income Households

Energy efficiency and conservation are underutilized means of combatting poverty, reducing global carbon dioxide emissions, and improving quality of life.[5] 'Energy efficiency' refers to technological improvements that enable appliances and other energy-intensive devices to use less energy to perform the same function.[6] Energy-efficient technologies are impactful in the short

3. *See id.*

4. *See id.*

5. Energy conservation refers to behavior that results in decreased energy use, such as turning lights off when they are not in use. *See, e.g., Use of Energy in the United States Explained*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/index.php?page=about_energy_efficiency (last updated Feb. 1, 2019).

6. *See id.*

term and long term.[7] The International Energy Agency ("IEA") has declared energy-efficiency measures as one of the most cost-effective ways to reduce energy consumption while also improving energy security and access to energy amongst vulnerable populations.[8] For example, according to the U.S. Office of Energy Efficiency and Renewable Energy, replacing a home's frequently used incandescent lightbulbs with either halogen incandescent bulbs, compact fluorescent lamps ("CFL"), or light emitting diodes ("LED") can result in a seventy-five dollars of annual energy savings.[9] Consumers can see these savings in each energy bill. Halogen incandescent, CFL, and LED bulbs also have useful lives that are three to twenty-five times longer than their incandescent counterparts and thus do not need to be replaced as frequently, leading to additional savings for years to come.[10]

Energy-efficiency innovations for heating and cooling systems have a similar potential to combat poverty, slow global warming, and improve lives. Heating and cooling costs account for fifty to seventy percent of residential energy use.[11] To help lower these costs, the U.S. Office of Energy Efficiency and Renewable Energy has recommended that building owners insulate exterior walls, including roofs and attics, and seal and insulate duct systems.[12] Sealing air leaks and insulating ducts allows heating and cooling systems to function more efficiently and saves the average American household twenty percent on monthly energy bills.[13]

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7. *See Invest in Energy-efficiency Measures that have a Rapid Payback*, ENERGY STAR, https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/find-cost-effective-investments (last visited Feb. 11, 2019) (listing of energy efficiency measures which create immediate energy savings and have low life-cycle cost, like ENERGY STAR certified lightbulbs which can operate on seventy-five percent less energy and last an average ten times longer than incandescent lightbulbs).

8. *See Meeting Climate Change Goals through Energy Efficiency*, INTER'L ENERGY AGENCY, https://www.iea.org/publications/freepublications/publication/MeetingClimateChangeGoalsEnergyEfficiencyInsightsBrief.pdf (last visited Jan. 30, 2019).

9. See *How Energy-Efficient Light Bulbs Compare with Traditional Incandescent*, ENERGY SAVER – OFFICE ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/how-energy-efficient-light (last visited Mar. 12, 2019).

10. *See id.*

11. *See Reduce Your Hearing Bills with Better Insulation*, ENERGY SAVER – OFFICE ENERGY EFFICIENCY & RENEWABLE ENERGY (Oct. 3, 2008), https://www.energy.gov/energysaver/articles/reduce-your-heating-bills-better-insulation.

12. *See id.*

13. A twenty percent reduction in heating and cooling bills resulting from sealing air leaks can equate to $83 to $166 a year. *See How Much Can You Really Save with Energy Efficiency Improvements*, ENERGY SAVER – OFFICE ENERGY EFFICIENCY & RENEWABLE ENERGY

Energy-efficient improvements can create many non-monetary benefits as well, increasing household comfort, health, and safety. For instance, heating and cooling system enhancements can improve home air quality and safety by reducing the introduction of pollutants into a home's air supply and mitigating the risk of gas leaks.[14] Households with improved energy efficiency also use less alternative heating equipment such as space heaters, which account for a third of all home heating fires and eighty-one percent of heating fire deaths.[15] Residents of energy-efficient homes are less likely to use stoves as alternative heating sources, lowering the risk of exposure to carbon monoxide or nitrogen dioxide.[16] A recent report in Massachusetts found that the health-related benefits of residential energy-efficiency improvements include declines in asthma symptoms, temperature-related stresses, exposure to carbon monoxide, and home fires.[17] Combined, these benefits result in lower annual medical costs and fewer deaths.[18]

Although some homeowners are motivated and able to make voluntarily energy efficiency improvements to their own homes without outside support or incentives, electric utilities have long played an important role in promoting energy-efficient investments at the residential level. There are three major types of utility companies, each structured differently to pursue specific goals and priorities. Most Americans get their electricity through an investor-owned utility (IOU).[19] IOUs are for-profit, private corporations that function as monopolies in their government-approved service areas.[20] IOUs

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AGENCY, https://www.energy.gov/energysaver/articles/how-much-can-you-really-save-energy-efficient-improvements (last visited Mar. 12, 2019).

14. *See id.*

15. *See* Diana Hernández & Douglas Phillips, *Benefit or Burden? Perceptions of Energy Efficiency Efforts among Low-Income Housing Residents in New York City*, 8 ENERGY RES. & SOC. SCI. 52, 59 (July 2015).

16. *See id.*

17. *See* Beth A. Hawkins, Dr. Bruce E. Tonn, Erin M. Rose, Greg Clendenning & Lauren Abraham, *Massachusetts Special and Cross-Cutting Research Area: Low-Income Single-Family Health- and Safety-Related Non-Energy Impacts (NEIs) Study*, PREPARED BY THREE3 & NMR GROUP, INC. BOS.: MA PA (MASS. PROGRAM ADM'RS), http://ma-eeac.org/wordpress/wp-content/uploads/Low-Income-Single-Family-Health-and-Safety-Related-NonEnergy-Impacts-Study.pdf (last visited Mar. 13, 2019) (Low-income, single-family households in the study saved up to a total of $941.87 annually, per unit when considering reduced interest rates and health costs, and increased home productivity).

18. *See id.*

19. *See* Elizabeth J. Wilson, Joseph Plummer, Miriam Fischlein & Timothy M. Smith, *Implementing Energy Efficiency: Challenges and Opportunities for Rural Electric Co-operatives and Small Municipal Utilities*, 36 ENERGY POL'Y 3383, 3384 (Sept. 2008).

20. *See id.*

are typically regulated at the state level by utility commissions and primarily serve large population centers where it is easier to derive revenue.[21] Municipal electric utilities ("MUs") and rural electric cooperatives ("RECs"), are more numerous than IOUs but tend to be smaller in size.[22] MUs are owned and operated by local jurisdictions and are usually governed by city councils or utility commissions.[23] RECs are non-profit utilities governed by consumer members, usually under a one-member, one-vote system.[24]

Over the years, utilities of all kinds have implemented programs aimed at reducing customers' energy consumption, often through energy conservation practices.[25] For example, utility implementation of demand-side management (DSM) programs—a type of energy conservation program—is on the rise.[26] DSM programs aim to reduce energy consumption by rewarding customers for conserving energy or for specifically reducing consumption during "peak" periods when there is a high demand for grid-supplied electricity.[27] Although these programs may help some customers save energy and money, others cannot benefit from such programs, which do not address the root issue of a lack of energy efficiency.

Although some utilities have had modest success in helping to lessen household energy bills through conservation programs and other initiatives, high energy burdens are still a widespread concern among energy consumers, utilities, and regulators.[28] The term "energy burden" refers to the percentage

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21. *See id.*

22. *See id.*

23. *See* at 3385.

24. *See id.*

25. While some sources describe DSM programs as energy efficiency programs, DSM programs more properly fall under the energy conservation umbrella. DSM programs aim to alter human behavior through stopping the use of certain power-consuming household items as a way of using less power overall, whereas energy efficiency focuses on increasing the efficiency of technologies so less electricity is used for the same task. It is important to distinguish the terms because some utility and industry statistics do combine the two, which gives an imprecise picture of how funds are invested and their impact.

26. From the 1990s to 2005, utilities increased funding of DSM programs by 35 percent. *See* Michelle De Blasi & Lauren A. Ferrigni, *The Energy-Water Nexus – How Policymaking is Shaping Generation and Usage Profiles in the Regional Southwest*, 8 ARIZ. J. ENVTL. L. & POL'Y 101, 116 (Summer 2018); *see also* Wilson, Plummer, Fischlein & Smith, *supra* note 19.

27. *See* Wilson, Plummer, Fischlein & Smith *supra* note 19 at 3389.

28. *See* Adrienne L. Thompson, *Protecting Low-Income Ratepayers as the Electricity System Evolves*, 37 ENERGY L. J. 265, 267-305 (Spring 2016) [hereinafter Thompson, *Protecting Low-Income Ratepayers*].

of a household's income that is spent on energy costs.[29] Low-income Americans households bear disproportionately high energy burdens and spend a higher percentage of their household income on energy-related expenses than their more affluent neighbors.[30] Low-income households spend between six and thirty percent of their household income on electricity, while their middle-and high-income counterparts spend only one to five percent.[31] Even more troubling is the fact that low-income households expend, on average about twenty-seven percent more on energy costs per square foot.[32] Such numbers are evidence of a daily struggle for many low-income households nationwide to manage energy-related expenses.

Not surprisingly, heavy energy burdens are more likely for households with low incomes and energy-inefficient homes.[33] The primary causes of energy inefficiency in residential buildings vary widely across the country. For example, urban Americans are more likely to live in rented apartments or other types of multifamily dwellings.[34] Such rental units tend to be less energy efficient and require higher energy costs per square foot on average than single-family homes.[35] Apartments with the lowest monthly rents tend to be particularly old and energy-inefficient. Indeed, low-income multifamily homes have an average of five fewer energy-efficient features compared to middle- and high-income family homes.[36] According to one recent study, this lack of energy-efficient features causes renters to pay up to three times more per square foot for household energy.[37]

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29. *See Low Income Community Energy Solutions*, U.S. DEP'T OF ENERGY, https://www.energy.gov/eere/slsc/low-income-community-energy-solutions (last visited Jan. 30, 2019) [hereinafter *Low Income Community Energy Solutions*].

30. *See id.*

31. *See id.*

32. *See* Tony G. Reames, Michael A. Reiner & M. Ben Stacey, *An Incandescent Truth: Disparities in Energy-Efficient Lighting Availability and Prices in an Urban U.S. County*, 218 APPLIED ENERGY 95, 96 (May 2018).

33. *See Low Income Community Energy Solutions*, *supra* note 29.

34. *See New Census Data Show Differences between Urban and Rural Populations*, U.S. CENSUS BUREAU, https://www.census.gov/newsroom/press-releases/2016/cb16-210.html (last visited Jan. 30, 2019) (data shows that 81.1% of rural Americans own their own homes while a comparatively lower 59.8% of urban Americans own their own homes).

35. *See* Stefen Samarripas, Dan York, & Lauren Ross, *More Savings for More Residents: Progress in Multifamily Housing Energy Efficiency*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON. (Feb. 22, 2017), https://aceee.org/sites/default/files/publications/researchreports/u1702.pdf.

36. *See Id.*

37. *See* Weston Berg, Seth Nowak, Meegan Kelly, Shruti Vaidyanathan, Mary Shoemaker, Anna Chittum, Marianne DiMascio, & Heather DeLucia, *The 2017 State Energy*

Low-income rural Americans also face disproportionately high energy costs, albeit for different reasons. On average, rural U.S. households spend about forty percent more of their income on energy bills than their metropolitan counterparts.[38] Much of this disparity between urban and rural energy burdens is attributable to the prevalence of manufactured homes in rural communities. Approximately twenty percent of rural residents live in manufactured homes, which can require energy costs that are double those of a comparably-sized, traditional, single-family home.[39] Households with the heavier energy burden associated with such homes often also bear a larger financial burden from living in a remote rural area necessitating greater overall transportation expenditures.[40]

Energy burdens are more than mere inconveniences for many low-income Americans. Heavy energy burdens have made approximately thirty-one percent of Americans energy insecure,[41] meaning they are unable to consistently meet basic energy needs such as adequately heating or cooling their homes.[42] One consequence of low-income households' heavier energy burdens is that they also face a higher risk of having their utility company shut off their gas or electricity for failure to pay their bills. In some areas of

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Efficiency Scorecard, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON. (Sept. 27, 2017), https://aceee.org/sites/default/files/publications/researchreports/u1710.pdf.

38. *See* Pat Remick & Emily Deanne, *Rural Households Spend Much More of Their Income on Energy Bills than Others*, NAT. RESOURCES DEF. COUNCIL (July 18, 2018), https://www.nrdc.org/media/2018/180718-0.

39. *See id.*; *see also* Lauren Urbanek, *Standards for Manufactured Housing will Mean Higher Quality and Better Comfort*, NAT. RESOURCES DEF. COUNCIL (Aug. 29, 2016) https://www.nrdc.org/experts/lauren-urbanek/standards-manufactured-housing-will-mean-higher-quality-and-better-comfort.

40. *See TET 2018 – Chapter 6 – Household Spending on Transportation*, U.S. BUREAU OF TRANSP. STAT., https://www.bts.gov/browse-statistical-products-and-data/transportation-economic-trends/tet-2018-chapter-6-household (last modified Dec. 28, 2018) (2017 report showed that rural households spend approximately 1.17 times more on transportation than urban individuals, largely due to a lack of rural public transportation options and greater distances between destinations. According to the report, based on the data from the U.S. Department of Labor and the Bureau of Labor Statistics, in 2017, urban residents' traffic expenses were about $9,511, while rural residents were $10,293).

41. *See* Dominic J. Bednar, Tony Gerard Reames, & Gregory A. Keoleian, *The Intersection of Energy and Justice: Modeling the Spatial, Racial/Ethnic and Socioeconomic Patterns of Urban Residential Heating Consumption and Efficiency in Detroit, Michigan*, 143 ENERGY & BUILLDINGS. 25, 25 (May 2017).

42. *See Residential Energy Consumption Survey*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/consumption/residential/reports/2015/energybills/ (last visited Jan. 30, 2019).

the country, low-income households are seven times more likely to experience these shutoffs than non-low-income households.[43] Despite some attempts to curb these shutoffs, energy rates have increased in several states over the last ten years, further exacerbating the struggles faced by low-income households.[44]

In extreme cases, a person's inability to shoulder household energy burdens can be health- and even life-threatening. Personal stories of individuals facing utility shutoffs because of their inability to handle their energy burden are deeply troubling. For instance, Kansas man Robert Roberts endured a life-threatening scare when his utilities were turned off—cutting off the power to the electronic medical device that allows him to breathe despite his chronic obstructive pulmonary disease ("COPD").[45] In other instances, electricity shutoffs during extreme weather have left households battling to stave off hypothermia or heatstroke.[46] The prevalence, gravity, and severity of these energy shutoff situations has led some advocacy organizations such as the National Association for the Advancement of Colored People ("NAACP") to criticize utility shutoffs as human rights violations.[47]

II. Existing Energy Efficiency Policies Affecting Low-Income Homes

Recognizing the substantial impact heavy energy burdens can have on low-income American households, policymakers at all levels of government have crafted programs aimed at reducing these burdens. Unfortunately, most of these existing policies and programs suffer from shortcomings that prevent

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43. *See* Bednar, Reames, & Keoleian, *supra* note 41 at 26.

44. *See* Jim Polson, *More Americans are Getting their Electricity Cut Off*, BLOOMBERG (Oct. 13, 2017), https://www.bloomberg.com/news/articles/2017-10-13/in-great-american-blackout-millions-go-dark-due-to-unpaid-bills; *see also Lights Out in the Cold – Reforming Utility Shut-Off Policies as if Human Rights Matter*, ENVTL. & CLIMATE JUST. PROGRAM, NAACP (Mar 2017), https://www.naacp.org/wp-content/uploads/2017/04/Lights-Out-in-the-Cold_NAACP-ECJP-4.pdf [hereinafter *Lights Out in the Cold*].

45. *See Lights Out in the Cold* at 4.

46. *Id.* at ix.

47. Research has shown that minority households experience higher energy burdens than the average household in the same city. This effect is compacted when other factors such as renting and being a low-income household in a multifamily building, which also contribute to higher energy burdens, are added. *See* Ariel Drehobl & Lauren Ross, *Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON. (April 2016), https://aceee.org/sites/default/files/publications/researchreports/u1602.pdf.; *see also id.*

such programs from enabling energy-efficiency technologies and benefits from reaching those citizens who need it most.

A. Federal Policies

Federal government agencies have long played a prominent role in governing and promoting energy efficiency, with some success.[48] The chief federal agency involved in these activities is the U.S. Department of Energy ("DOE"), which oversees a wide range of national energy initiatives.[49] In relation to energy efficiency, the most important office within the DOE is the Office of Energy Efficiency and Renewable Energy ("EERE").[50] The EERE promotes sustainable energy-efficient measures in the transportation, building, and power generation sectors.[51] The DOE and EERE have implemented and continue to oversee numerous programs that encourage energy efficiency. These programs target a wide range of areas, including appliance and equipment efficiency standards, energy-saving building codes, and information campaigns to educate the public about energy use.[52]

Another important federal regulator involved in shaping energy-efficient policies is the Environmental Protection Agency ("EPA"). Although the EPA focuses primarily on protecting the natural environment, the agency is also charged with helping to protect human health.[53] The EPA's most well-known energy efficiency program is the ENERGY STAR program, which is a joint EPA and DOE initiative.[54] The ENERGY STAR program was originally

48. The National Appliance Energy Conservation Act of 1987 (NAECA) is one example of the federal government's expansive and preemptive power in the arena of energy efficiency, the NAECA expressly states that "no State regulation, or revision thereof, concerning the energy efficiency, energy use… of [a product covered by federal efficiency standard] shall be effective with respect to such covered program." Alexander B. Klass, *State Standards for Nationwide Products Revisited: Federalism, Green Building Codes, and Appliance Efficiency Standards*, 34 HARV. ENVTL. L. REV. 335, 348 (2010); *see also* 42 U.S.C. §6297 (2012).

49. *See About Us*, U.S. DEPARTMENT OF ENERGY, https://www.energy.gov/about-us (last visited Feb. 13, 2019).

50. *See About Us*, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/about-office-energy-efficiency-and-renewable-energy (last visited Feb. 13, 2019).

51. *Id.*

52. *Id.*

53. *See Our Mission and What We Do*, U.S. ENVIRONMENTAL PROTECTION AGENCY, 2019, https://www.epa.gov/aboutepa/our-mission-and-what-we-do (last visited Feb. 14, 2019).

54. *See Energy Star*, U.S. DEPARTMENT OF ENERGY, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/buildings/energy-star (last visited Feb. 13, 2019).

introduced by the EPA in 1992 as a voluntary program to educate consumers about product energy-efficiency.[55] The program has since expanded to include 18,000 private and public partnerships to label energy-efficient appliances ranging from industrial buildings and new homes to office equipment, home appliances, and lightbulbs.[56] In 2012, the program was estimated to have saved consumers $24 billion in energy costs.[57]

In an example of multiagency cooperation, the EPA and DOE partnered with the Department of Housing and Urban Development ("HUD") in 2002 to promote the use of ENERGY STAR products in its affordable housing programs.[58] HUD was created as part of the Civil Rights Act of 1968, which brought housing under its umbrella of protections by prohibiting discrimination in the sale, rental, and financing of houses.[59] HUD's primary role is to address housing concerns for Americans who are low-income, disabled, or veterans.[60] HUD is well-known for promoting affordable housing but also plays a key role in advocating for energy-efficient technologies within low-income communities.[61] For example, DOE and HUD have developed the Better Building Challenge—a voluntary commitment for building owners and managers to reduce energy consumption by twenty percent over a ten-year period through increased energy efficiency.[62]

In addition to their programs focused on energy efficiency, HUD has a number of other programs aimed at alleviating energy burdens for low-

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55. *See About Energy Star: History*, ENERGY STAR, https://www.energystar.gov/about/history-0 (last visited Jan. 30, 2019).

56. *Id.*

57. *Id.*

58. *See Energy Star and Other Federal Programs*, U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT, https://www.hud.gov/program_offices/public_indian_housing/programs/ph/phecc/federal (last visited Feb. 11, 2019) [hereinafter *Energy Star and Other Federal Programs*].

59. The Civil Rights Act of 1968 prohibits discrimination based on race, religion, national origin, sex, handicap, and family status; Title VIII of the Civil Rights Act of 1968 is referred to as the Fair Housing Act (of 1968). *See History of Fair Housing*, U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT, https://www.hud.gov/program_offices/fair_housing_equal_opp/aboutfheo/history (last visited Feb. 13, 2019).

60. *Id.*

61. *See HUD Programs that Support Energy Efficiency*, U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT, https://www.hud.gov/program_offices/economic_development/eegb/programs (last visited Feb. 14, 2019).

62. *See Multifamily Better Buildings Challenge*, U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT, 2019, https://www.hud.gov/program_offices/economic_development/eegb/challenge (last visited Jan. 15, 2019) [hereinafter *Multifamily Better Buildings Challenge*].

income households. To provide immediate relief, HUD provides utility allowances to eligible households that range from $10 to $200 per month.[63] HUD also spends roughly $6.4 billion on broader utility-assistance programming, provides information about energy consumption and costs and helps citizens prioritize energy-efficiency improvements.[64] Since 2005, HUD has likewise supported local Public Housing Agencies ("PHAs") in their use and of energy- efficient technologies.[65]

In addition to setting minimum standards and educating consumers about energy efficiency, the federal government provides some limited financial assistance to citizens seeking to make energy-efficient improvements to their homes. The Federal Housing Administration's PowerSaver Loan Program ("PSLP") provides several financing options for homeowners to make energy-efficient upgrades to their homes.[66] The Low-Income Home Energy Assistance Program ("LIHEAP") and the Weatherization Assistance Program ("WAP") are two other financial assistance programs aimed at promoting investments in energy-efficiency in low-income households through grants.[67] LIHEAP is a federally-funded program administered through the Department of Health and Human Services ("HHS") that provides assistance to qualified low-income families to cover energy costs associated with high home energy bills and energy crises.[68] The program is

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63. *See Utility Allowances*, U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT, https://www.hud.gov/program_offices/public_indian_housing/programs/ph/phecc/allowanca l (last visited Feb. 11, 2019).

64. *See Utilities, Benchmarking and Data Access*, U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT, https://www.hud.gov/program_offices/economic_development/ eegb/utilities (last visited Jan. 15, 2019) [Hereinafter *Utilities, Benchmarking and Data Access*].

65. *See Energy Star and Other Federal Programs*, *supra* note 58.

66. These loans can reach up to $25,000 with repayment periods of 20 years, allowing qualified recipients to choose how they want to invest the borrowed funds: energy-saving improvements, solar, and/or renewable energy systems. *See FHA PowerSaver*, U.S. Department of Energy, accessed February 11, 2019, https://www.energy.gov/eere/ solarpoweringamerica/fha-powersaver (last visited Feb. 11, 2019) [hereinafter *FHA PowerSaver*].

67. Whereas PSLP is a loan program requiring repayment, LIHEAP and WAP provide grants that households do not need to repay. Both LIHEAP and WAP have their own distinct and practical purpose, but both are meant to be accessible by similar populations—namely the type of low-income American households that may be excluded under the PSLP's requirements.

68. LIHEAP targets households that fall below the Federal Poverty Guidelines (FPG) or state median income levels, with priority given to households with members that are elderly, disabled, or young children. Community action agencies and social service groups typically

primarily intended to provide utility bill assistance but also allows for fifteen percent of funds, or up to twenty-five percent of funds with an approved waiver, to be spent on weatherization assistance.[69] In contrast, WAP seeks primarily to provide financial assistance for low-income households for energy-efficient upgrades.[70] Among other things, WAP involves the use of computerized energy assessments to determine the most effective measures to create a more energy-efficient home.[71]

Although the federal government's existing financial assistance programs can be helpful in some contexts, each program has significant limitations. For instance, the PSLP can be a great resource for American households that need relatively limited assistance, several of the program's qualifications exclude many low-income households from participating.[72] LIHEAP's critics argue

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assist residents in accessing LIHEAP program funding. The LIHEAP program is available in all 50 states, five territories, and 140 tribal organizations. *See About LIHEAP*, U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES, OFFICE OF COMMUNITY SERVICES, https://www.acf.hhs.gov/ocs/programs/liheap/about. (last visited Jan. 15, 2019); *see also* Deborah Behles, *From Dirty to Green: Increasing Energy Efficiency and Renewable Energy in Environmental Justice Communities*, 58 VILL. L. REV. 25, 27-8 (2013); *see also LIHEAP Fact Sheet*, U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES, OFFICE OF COMMUNITY SERVICES (Nov. 16, 2018), https://www.acf.hhs.gov/ocs/resource/liheap-fact-sheet-0 [hereinafter *LIHEAP Fact Sheet*].

69. Weatherization is defined as the act of protecting a dwelling against the weather. In 2017, 5.4 million homes received energy payment assistance totaling $1.8 billion. Another $374 million was spent on weatherization and other energy-related home repairs. *See LIHEAP Fact Sheet*, *supra* note 68; *see also Weatherization*, MERRIAM-WEBSTER DICTIONARY, https://www.merriam-webster.com/dictionary/weatherize (last visited Jan. 30, 2019).

70. Like LIHEAP, WAP is available to residents of all 50 states, the District of Columbia, Native American Tribal lands, and five territories. WAP grants are currently administered through partnerships with 800 local agencies. *See Weatherization Assistance Program*, U.S. DEPARTMENT OF ENERGY, https://www.energy.gov/eere/wipo/weatherization-assistance-program (last visited Jan. 15, 2019); *see also Weatherization Assistance Program Fact Sheet*, U.S. DEPARTMENT OF ENERGY, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/sites/prod/files/2018/06/f52/EERE_WAP_Fact%20Sheet-v2.pdf (last visited Feb. 12, 2019) [hereinafter *WAP Fact Sheet*].

71. This science-based approach to use of funds has led to an average of $1.72 in energy-related savings for every $1.00 of WAP funds spent. The average household that takes advantage of WAP saves an estimated $283 a year, or seven percent in electric consumption and eighteen percent in heating consumption. In addition to electricity savings, WAP providers also identify and address health and safety risks in the homes they serve. WAP has served over 7 million American households. *See WAP Fact Sheet, supra* note 70.

72. The PSLP requires borrowers to have a minimum credit score of 660, targets only detached, single-family, owner-occupied homes, and requires homeowners to have substantial equity in their homes. The qualifications have logical roots, but in practice they prohibit some of the Americans who need the program the most from accessing it. *See FHA PowerSaver*,

that the program primarily provides only temporary bill assistance and largely fails to address the energy efficiency problems that are a major contributor to many households' high energy bills.[73] Additionally, although WAP is focused mainly on energy inefficiency, the program currently suffers from low participation rates.[74]

Recently, progress in federal energy-efficiency policy has been hampered by the change in energy sector priorities evident within the Trump administration. The American Council for an Energy-Efficient Economy ("ACEEE"), a leading nonprofit authority on energy-efficiency policy, highlighted these changes in U.S. energy efficiency policy in their 2018 International Energy Efficiency Scorecard. The report attributed the U.S.'s "energy efficiency score" drop from 61.5 to 55.5 out of 100 to "[t]he current administration's focus on energy production rather than efficiency," which has resulted in little to no progress on federal energy efficiency policies—and even threats to terminate or weaken some programs.[75]

B. State and Local Policies

In spite of the shortcomings of the nation's federal energy-efficiency policies and programs, many states and localities have implemented their own energy-efficiency policies and programs aimed at lower-income

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supra note 66; *see also* Mark Zimring, *HUD PowerSaver Pilot Loan Program*, LAWRENCE BERKELEY NATIONAL LABORATORY, ENVIRONMENTAL ENERGY TECHNOLOGIES DIVISION (Dec. 10, 2010), https://cloudfront.escholarship.org/dist/prd/content/qt7sf1j4gb/qt7sf1j4gb.pdf.; *see also* Sara Sternberg Greene, *The Bootstrap Trap*, 67 DUKE L. J. 234, 260 (November 2017); *see also* Thompson, *Protecting Low-Income Ratepayers*, *supra* note 28.

73. *See* Bednar, Reames & Keoleian, *supra* note 41.

74. *See* Meredith Fowlie, Michael Greenstone & Catherine Wolfram, *Are the Non-Monetary Costs of Energy Efficiency Investments Large? Understanding Low Take-Up of a Free Energy Efficiency Program*, 105 AM. ECON. REV. 201 (May 2015) (discusses the low participation rate of households in programs like the WAP despite having zero out-of-pocket costs and suggests that non-monetary reasons, including obligations like contacting staff, meeting with contractors, and opening their homes to construction teams, resulted in low participation rates).

75. In the example of building policy, the Trump administration has put a halt to stricter appliance standards. In addition to impacting American households that may benefit from energy efficiency policies, this change in place means that the U.S. may lose its reputation as a leader in areas like building-sector energy efficiency. The ACEEE expects to see similar policy decisions and repercussions for the duration of the Trump administration. Fernando Castro-Alvarez, Shruti Vaidyanathan, Hannah Bastian & Jen King, *The 2018 International Energy Efficiency Scorecard*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY (June 2018), https://aceee.org/sites/default/files/publications/researchreports/i1801.pdf.

households in recent year, with mixed success.[76] Low-income households in states and cities with the most advanced energy-efficiency policy regimes are surely reaping benefits, but such schemes obviously are not in place nationwide.[77] Frequent changes in state or local energy-efficiency programs can also make it difficult for low-income households to attain the information they need to make educated choices and to fully take advantage of these policies.

Whereas federal energy-efficiency programs have focused more on manufacturing standards and the provision of funding through grants and other financial assistance, measures taken at the local government level concentrate on a mix of best practice initiatives, building codes, and loan programs.[78] For instance, at least fifty local energy-efficiency challenge programs in the U.S. aim to motivate building owners to reach certain energy-efficiency goals.[79] Local governments also account for governing over thirty commercial and residential property assessed clean energy ("PACE") programs which provide energy-efficiency loans.[80]

PACE programs provide loans for investments in energy-efficient improvements such as better insulation, air duct sealing, roofing, and water insulation.[81] PACE programs also provide loans for solar photovoltaic systems, which do not impact home energy efficiency but may help lighten a household's energy burden.[82] One unique characteristic of the PACE program is that PACE loans are tied to the property, rather than to the individual, and can be repaid through property taxes.[83] This structure helps incentivize citizens to invest in energy-efficiency improvements even if they

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76. *See* Lara Ettenson, *States Lead the Way on Energy Efficiency as Feds Falter*, NATURAL RESOURCES DEFENSE COUNCIL (Oct. 2, 2017), https://www.nrdc.org/experts/lara-ettenson/states-lead-way-energy-efficiency-feds-falter.

77. *Id.*

78. Locally-administered loan programs focus on an array of approaches to decreasing the energy burden, including via investment in renewable energy, energy efficiency, and more.

79. Over 1,100 commercial entities and an astounding 158,000 households have participated in locally administered PACE projects, investing nearly $4 billion in energy-efficiency upgrades. *See How City-Led Efficiency Efforts Can Support State Energy Planning*, U.S. DEPARTMENT OF ENERGY (Oct. 23, 2017), https://www.energy.gov/sites/prod/files/2017/10/f38/Pathways-Cities_1017.pdf [hereinafter *City-Led Efficiency Efforts*].

80. *Id.*

81. *Id.*

82. *Id.*

83. *See Property Assessed Clean Energy Programs*, U.S. DEPARTMENT OF ENERGY, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/slsc/property-assessed-clean-energy-programs (last visited Feb. 12, 2019).

expect to relocate before personally recouping their investment or realizing the improvements' full benefits.[84] PACE programs do have many advantages, but they also have a couple major weaknesses. For instance, PACE programs have been largely successful in the commercial sector, but resistance from the mortgage industry has made residential PACE financing more onerous.[85] Also, because PACE programs require extensive evaluations of homes to determine eligibility, high administrative costs prevent many local governments from implementing them.[86]

Many local energy-efficiency initiatives are innovative and valuable, but most unfortunately fail to impact the lowest-income citizens of a community. For example, one type of local energy-efficiency program implemented in several localities is known as the "Kilowatt Crackdown." The Kilowatt Crackdown is a voluntary competition among local building owners and tenants in some cities designed to reduce building energy consumption and operating costs.[87] The competition promotes both energy conservation and investment in energy-efficient technologies.[88] A nonprofit entity called the Northwest Energy Efficiency Alliance ("NEEA") administered a Kilowatt Crackdown competition across several Pacific Northwestern cities between 2007 and 2013.[89] During those seven years, over 300 buildings participated.[90] Although the program did help to drive some conservation and new investment in energy efficient technologies in those buildings, it unfortunately only involved office buildings so low-income homeowners were excluded.[91]

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84. *Id.*

85. *See* Ashley L. Thompson, *Residential PACE Programs Struggle, Commercial Programs Thrive*, 25 ENVTL. LITIG. COMM. NEWSLETTER *18-20* (Fall 2013).

86. *See* Michael A. Wrapp, *Property Assessed Clean Energy (PACE): Victim of Loan Giants or Way of the Future*, 27 NOTRE DAME J. L. ETHICS & PUB. POL'Y 273, 281 (Jan. 1, 2013).

87. *See City-Led Efficiency Efforts*, *supra* note 79.

88. .*See Kilowatt Crackdown*, THE CITY OF PORTLAND OREGON, https://www.portlandoregon.gov/bps/article/416436 (last visited Feb. 14, 2019) [hereinafter *Portland Kilowatt Crackdown*].

89. *See* Edward Vine & Christopher Jones, *Competition, Carbon, and Conservation: Assessing the Energy Savings Potential of Energy Efficiency Competitions*, 19 ENERGY RESEARCH & SOC. SCI. 158, 175 (Sept. 2016).

90. *Id.* at 164.

91. Portland's competition, for example, was only open to buildings larger than 25,000 square feet. In addition to the monetary savings, together the participants reduced CO2 emissions by an estimated 59 million pounds. *See Portland Kilowatt Crackdown, supra* note 88.

One promising state-level approach to encouraging household energy efficiency is the implementation of energy-efficiency resource standards ("EERS"). EERS are long-term energy savings targets for utilities designed to motivate utilities to encourage and facilitate customer energy efficiency investments.[92] Although EERS policies are relatively inexpensive for governments to implement and can drive private energy efficiency investment, many states have not yet adopted them. As of early 2019, thirty states and the District of Columbia had adopted their own energy-efficiency policies.[93] Of those jurisdictions, just twenty-four have adopted EERS.[94] Unfortunately, according to one 2017 report, some states such as Indiana and Minnesota have actually rolled back energy efficiency policies in recent years.[95]

Additionally, some states have implemented non-binding energy-efficiency goals. While these goals can be a step in the right direction, many do not directly address how utilities and households can most effectively reach the established goals. For example, the Alaskan legislature enacted a goal requiring a fifteen percent per capita reduction in electricity consumption by 2020, but state officials have yet to implement specific requirements for utilities to achieve this goal.[96] Lacking specific requirements leads to insufficient funds for meaningful implementation through proven approaches like weatherization. In Alaska, its WAP is primarily funded by the federal government because the state does not require spending by utilities.[97] This lack of utility involvement has led to an inability to weatherize all households in need.[98]

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92. *See Energy Efficiency Resource Standards*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, https://aceee.org/topics/energy-efficiency-resource-standard-eers (last visited Jan. 17, 2019).

93. *See Many States Have Adopted Policies to Encourage Energy Efficiency*, U.S. ENERGY INFORMATION ADMINISTRATION (Aug. 3, 2017), https://www.eia.gov/todayinenergy/detail.php?id=32332.

94. *Id.*

95. Indiana, for example, has discontinued their Energizing Indiana program, which set energy efficiency targets for utilities and offered an Income-Qualified Weatherization Program. *See State and Local Policy Database: Indiana*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, https://database.aceee.org/state/indiana (last modified Oct. 2018); *see also id.*

96. *See State and Local Policy Database: Alaska*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, https://database.aceee.org/state/alaska (last modified Oct. 2018).

97. Federal funding is bolstered by state, utility, and organization supplements in some cases. *See id.*

98. According to ACEEE, approximately 100 homes of the 395 accepted were weatherized. *See id.*

In comparison, states like Massachusetts have taken a more aggressive approach. Massachusetts' EERS require electric utilities to decrease energy consumption by 2.7 percent annually by 2021.[99] The Massachusetts plan involves a variety of energy-savings approaches, but energy-efficiency programs—even ones directed specifically at low-income households—play a key role.[100] Massachusetts created an Energy Efficiency Advisory Council ("EEAC") that designs, approves, and monitors IOU programs, including energy-efficiency education programs for low-income households.[101] The EEAC's goals through 2021 include increasing energy-efficiency program participation by underserved residents with the highest energy burdens.[102] Thanks to the state's proactive, progressive policies and programs, the ACEEE has recognized Massachusetts as a leader among states in energy efficiency policy.[103]

Weatherization assistance programs are one other promising but underutilized state policy approach to lighten energy burdens for low-income households. For every dollar invested in weatherization, the DOE estimates that $1.72 is generated in energy-savings benefits.[104] Unfortunately, few states offer incentives or programs to encourage weatherization.

In summary, although several agencies and energy-efficiency programs exist at the federal, state, and local levels to offer some limited assistance for low-income households, these programs and policies fall far short in meeting

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99. *See* MASS. ENERGY EFFICIENCY ADVISORY COUNCIL, *Mass. Energy Efficiency Div., Resolution Regarding the 2019-2021 Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Investment Plan* (introduced Oct. 30, 2018) [hereinafter MASS. THREE YEAR PLAN].

100. The state requires ten percent of utility funds spent on energy efficiency programs to target low-income customers, specifically. *See* MASS. GEN. LAWS ch. 25, §19 (2015); *see also id.*

101. *See State and Local Policy Database: Massachusetts*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, https://database.aceee.org/state/massachusetts (last modified July 2018).

102. MASS. THREE YEAR PLAN, *supra* note 99.

103. *Id.*

104. The return on investment for every $1 spent on weatherization rises to $2.78 when non-energy benefits are also considered. These non-energy benefits include community economic benefits such as job creation as well as tangential benefits for the household members. After weatherization, households have lower healthcare costs and fewer missed days of work thanks to a safer, more livable home. These health and household-related benefits are estimated to be $14,148 per unit. *See* Kathleen Hogan, *Getting it Right: Weatherization and Energy Efficiency are Good Investments*, U.S. DEPARTMENT OF ENERGY (Aug. 10, 2015), https://www.energy.gov/eere/articles/getting-it-right-weatherization-and-energy-efficiency-are-good-investments; *see also WAP Fact Sheet*, *supra* note 70.

current and future needs. More innovative and aggressive policies and programs are needed to ensure that low-income American households have greater access to valuable energy-efficiency technologies.

III. Policy Solutions

Fortunately, there are several ways that energy-efficiency policies and programs can be improved to better reach and serve low-income households. The most promising strategies for helping more low-income Americans to realize the benefits of energy efficiency are those that address the obstacles highlighted above. Lightening energy burdens for low-income Americans through energy efficiency will require utility-supported, locally-tailored, clearly-communicated, and goal-oriented policies.

A. Utility-Supported

Reliable, firm utility support is key to improving energy-efficiency programs across the United States. Electric utilities are often in the best position to ensure that energy efficiency programs reach the Americans who need them most. Utilities already produce and deliver electricity to low-income households and have direct contact with these customers. They are usually the first line of assistance for low-income households that are unable to bear their energy burden. Accordingly, it is critical that utility incentives are aligned with policies and programs enacted to address energy inefficiencies in low-income households.

As described *infra*, government-mandated funding carve-outs are one means of encouraging utilities to promote energy efficiency in their customers' homes.[105] A national utility scorecard system that ranks utilities according to their energy-efficiency promotion efforts might also help to motivate some utilities to increase efforts in this area, particularly when financial incentives are attached. With utilities, governments, and consumers working together with the same goal—increasing energy efficiency to decrease energy burdens—there is hope for low-income households.

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105. A term with several meanings, "carve-out" is used here to refer to moneys set aside from a larger funding pool for a specific purpose. *See Carve-out,* THOMSON REUTERS, https://1.next.westlaw.com/Document/I2104b8dcef0811e28578f7ccc38dcbee/View/FullText.html?contextData=(sc.Default)&transitionType=Default&firstPage=true&bhcp=1&OWSessionId=bacc228cc1a2480d8122b7010d011b4c&isplcus=true&fromAnonymous=true (last visited Jan. 31, 2019).

1. Utility Carve-Outs for Weatherization Programs

Many utilities and local governments already work together to address energy efficiency in some way, but not all approaches to utility-sponsored energy efficiency are created equally. [106] For example, utilities seeking to limit initial administrative burdens may offer financial assistance to customers to help offset the cost of energy-efficiency upgrades. Unfortunately, such programs can be limited in scope and accessibility. Much more can be done to strengthen these programs and make them more accessible to utilities' lowest-income customers. Implementing state-level regulations requiring utilities to set aside some minimum amount of profits for efficiency upgrades to low-income customers' homes—namely through weatherization—is an effective way to increase utility investment in energy efficiency programs that can best serve low-income households today and into the future. Although such mandates would not decouple utility profits and energy consumption, they would hold utilities more responsible for promoting energy efficiency in low-income communities. [107]

Weatherization improvements are the ideal area of investment for carve-out requirements because they attack the roots of energy inefficiency and can have a sizeable impact upon energy burdens. By isolating and insulating homes, weatherization techniques seal the home to keep heated or conditioned air inside the home and extreme temperatures out.[108] Common weatherization measures such as adding insulation and sealing air leaks can save low-income American households hundreds of dollars in energy savings each year.[109]

Some states have seen success in implementing carve-out requirements. Massachusetts provides an example of a limited utility carve-out

106. *See Local Utilities and Other Energy Efficiency Program Sponsors*, U.S. ENVIRONMENTAL PROTECTION AGENCY, https://www.epa.gov/statelocalenergy/local-utilities-and-other-energy-efficiency-program-sponsors (last modified Aug. 22, 2018) [hereinafter *Local Utilities Program Sponsors*].

107. Decoupling, in the utility context, refers to the separation of utility sales from revenues, commonly by creating a revenue per customer formula so that utilities' revenues no longer rely on consumption. Criticism of this approach is that it does not incentivize utilities to implement energy efficiency programs but rather neutralizes disincentives. *See Decoupling Utility Profits from Sales*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, https://aceee.org/topics/decoupling-utility-profits-sales (last visited Mar. 18, 2019).

108. *See Frequently Asked Questions about the Weatherization Assistance Program*, NEW HAMPSHIRE OFFICE OF STRATEGIC INITIATIVE, https://www.nh.gov/osi/energy/programs/weatherization/faq.htm (last visited Jan. 31, 2019).

109. See discussion *supra* Part I.

requirement. A Massachusetts law requires utilities to set aside a percentage of their total budget for energy efficiency funding. Out of those funds, a portion must be spent on programs designed specifically for low-income households.[110] Massachusetts's overall energy efficiency program has saved customers $9,339,414,836.00, or $4.69 for every dollar invested, between 2013 and 2015.[111] This amount includes energy efficiency initiatives targeting low-income households, with low-income program goals either met or exceeded.[112]

A criticism of required utility-run weatherization programs is that the administrative burden they impose can be costly. In the short term, it can be argued, it is less of an administrative burden for a utility to provide low-income households with a lower utility rate. In the long-term, however, there are benefits to utilities investing in weatherization programs. Weatherization programs are likely to lead to fewer kilowatt hours sold at income-based discount electricity rates and fewer delinquent utility bills.[113] In the past decade, utility shutoff rates have increased.[114] When customers, oftentimes low-income customers, are unable to pay their utility bills or the high fees and interest rates associated with shutoffs, utilities lose profits.[115] By addressing the root cause of energy burdens from energy inefficiency, utility-supported weatherization programs benefit both low-income households and the utilities who provide their power.

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110. See discussion *supra* Part II.B.

111. *See Massachusetts Energy Efficiency Efforts Providing Unprecedented Savings to Customers*, MASS SAVE (Aug. 9, 2016), https://www.masssave.com/en/about/news-and-events/News/massachusetts-energy-efficiency-efforts-providing-unprecedented-savings/.

112. See *id*. See also discussion supra Part I (additional, non-energy benefits include decreased health hazards and associated costs).

113. *See* Martin Schweitzer & Bruce Tonn, *Non-Energy Benefits of the U.S. Weatherization Assistance Program: A Summary of their Scope and Magnitude*, 76 APPLIED ENERGY 321, 323 (December 2003) (discusses five different benefits from low-income weatherization improvements, which included avoided rate subsidies, reduced debt write-offs, reduced delinquent bills, fewer administrative costs associated with notice, and fewer utility shut offs).

114. Because not all states collect data on utility shut-offs it is hard to determine the national rate, however in 2016 California reported approximately 700,000 shut-offs, sixty-four percent increase from that in 2010, and Texas reported 900,000 shut offs, triple the amount in 2006. *See* Kristen Verclas & Eric Hsieh, *From Utility Disconnection to Universal Access*, 31 THE ELEC. J. 1 (July 2018).

115. .*See id*. at 6.

2. Federal Incentivizes

A national scorecard program recognizing the best-performing utility in promoting energy efficiency could further improve utilities' incentives to increase investments in energy efficiency programs. National scorecards for utility performance in energy efficiency are already created by organizations such as ACEEE.[116] Current ACEEE scorecards examine overall energy-efficiency programs for commercial and residential buildings. [117] While such data does provide valuable insight, a federally-implemented scorecard system could hone in on programs implemented to address the heavy energy burdens of low-income households. In addition to the natural pressure imposed by public national recognition, utilities with exemplary scores should receive monetary reward for their efforts. Especially when profits are a main driver, such as in the case of investor-utilities, the combination of positive publicity and monetary incentives can be strong motivators.

One obvious criticism of such a program is that federal funds should not be used to motivate private companies to do the work they arguably should already be doing—investing in best serving their customers. Given the fact that the federal government already expends billions of dollars annually on federal low-income utility bill assistance,[118] however, rewarding high-performing utilities for addressing the sources of energy burdens nationwide can limit federal funds going towards utility assistance in the long-term. Additionally, the detrimental impact of high energy burdens on low-income populations is a nationwide issue that should be of concern to the federal government.

In addition to motivating utility investment in energy-efficiency programs through public awareness and scrutiny, a national scorecard system can be a useful tool to guide utilities towards best practices for serving low-income households. By positively reinforcing utility investment in energy efficiency programs targeting low-income households and improving the sharing of information among them, scorecard-linked federal incentives provide a great opportunity for the federal government to contribute to progress in increasing energy efficiency for the nation's most vulnerable populations.

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116. *See* Grace Relf, *The Results are in: Here are the Most Energy-Efficient Utilities in the US*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY (June 13, 2017), https://aceee.org/blog/2017/06/results-are-here-are-most-energy.

117. *See id.*

118. HUD alone spends nearly $6.4 billion each year on utility assistance. *See Utilities, Benchmarking and Data Access*, *supra* note 64.

B. Locally-Tailored Building Codes

Local tailoring of building code provisions related to energy efficiency ensures that these codes are best suited to address the unique challenges faced in different parts of the U.S. From tropical beachfront bungalows to frigid Alaskan cabins and from urban high-rise condos to rural homesteads, there is no such thing as the standard American home. Accordingly, no single approach to building codes can promote the optimal strategies for improving energy efficiency in every low-income American household, especially when building codes are aimed at improving weatherization.[119] Locally-tailored building codes, which can be most effectively tailored at the municipal level, provide the required flexibility for local governments to incentivize and mandate designs that are the most appropriate for the unique climate, geography, building materials, and home types found in their community.[120]

Building codes that set minimum energy-efficiency requirements are referred to as "building energy codes."[121] Landowners and builders are required, by law, to observe building energy codes during the construction of new buildings and renovation of existing buildings.[122] In the past decade alone, changes in building energy codes have saved U.S. businesses and homes thirty percent on energy bill expenditures.[123] Some residential codes target insulation standards for buildings' thermal envelope,[124] including testing for air leakage rates which may not exceed five air changes per

119. The cost, appropriate type, and effectiveness of weatherization treatment varies geographically. Homes in colder climates have been found to benefit most, in terms of energy savings, from weatherization. This is because of the energy required for temperature control as well as the prevalence of older homes as compared to warmer regions in the U.S. Newer homes tend to be more energy efficient thanks to more advanced building technologies. Additionally, weatherization efforts create different results in inner-city settings nationwide because of different climates, housing stocks, and temperature control technologies in use. *See* Jonathan L. Bradshaw, Elie Bou-Zeida, & Robert H. Harris, *Comparing the Effectiveness of Weatherization Treatments for Low-income, American, Urban Housing Stocks in Different Climates*, 69 ENERGY & BUILDINGS, 535, 541–42 (2014).

120. *See id.*

121. *See Saving Energy and Money with Building Energy Codes in the United States*, U.S. DEPARTMENT OF ENERGY, https://www.energy.gov/sites/prod/files/2017/01/f34/Appliance%20and%20Equipment%20Standards%20Fact%20Sheet-011917_0.pdf (last visited Jan. 30, 2019).

122. *See id.*

123. *See id.*

124. Building's thermal envelope refers to "the basement walls, exterior walls, floor, roof and any other building elements that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space." 1 I.E.C.C §R202 (2016).

hour.[125] While some jurisdictions have ignored residential energy efficiency issues, others have confronted them aggressively. For instance, the city of Denver adopted energy code requirements for residential construction in 2016 based on the model International Energy Conservation Code (IECC).[126]

Locally-tailored building codes are also useful tools in addressing the issue of split incentives. By their nature, building codes place the costs of mandated energy efficiency in new buildings and renovations upon builders and landowners. Additionally, locally-tailored building codes can also provide valuable information to builders, landowners, and tenants. Armed with reliable information about how to best increase energy efficiency in their climate and location—and the requirement for certain energy-efficiency upgrades to be made as a normal part of construction—these stakeholders can make the best choices about how to invest in the best energy efficiency changes for their situation. Finally, locally-tailored programs can also leverage local knowledge and connections with builders and construction companies.[127]

In their efforts to promote energy efficiency through building codes, cities must keep in mind the financial impact of such building codes. While energy-efficient technologies can save consumers money in the long-term, in the short term there is a risk that increased building costs can be passed on to consumers by driving up the local cost of housing.[128] Opponents of stringent building codes often cite past reports illustrating a correlation between strict land use regulations and higher housing costs and decreased housing supply

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125. *See* 4 I.E.C.C. §R402.4.1.2 (2016); *see also* DENVER, COLO., CODE OF ORDINANCES §10-16 (2019).

126. The IECC is a set of energy-efficiency building codes adopted by the International Code Council to establish minimum requisites for energy efficiency in new residential and commercial buildings. *See Overview of the International Energy Conservation Code*, INTERNATIONAL CODE COUNCIL, https://www.iccsafe.org/codes-tech-support/codes/2018-i-codes/iecc/ (last visited Feb. 14, 2019); *see also Energy Code Requirements for Residential Construction*, CITY & COUNCIL OF DENVER (Nov. 7, 2017), https://www.denvergov.org/content/denvergov/en/community-planning-and-development/news/2017/residential-energy-code-policy.html; *see also The City Energy Efficiency Scorecard*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY (May 8, 2017), https://database.aceee.org/city-scorecard-rank (discussing Denver's 2017 top 10 ranking among the nation's cities for best energy efficiency policies by ACEEE).

127. *See Local Utilities Program Sponsors*, *supra* note 106.

128. Denver is currently experiencing an increase in housing costs, with the ninth highest salary requirement for purchasing a median-priced home compared to 50 other large metropolitan cities. *See* Aldo Svaldi, *House Hunting in Denver Metro? Better Bring in $90K a Year to get an Average Home*, THE DENVER POST (Nov. 15, 2018), https://www.denverpost.com/2018/11/15/denver-salary-median-home/.

as a reason for their opposition.[129] Current data, however, suggests that the savings created by code-mandated energy-efficiency improvements outweigh the costs over time. In 2012, single-family homes built in compliance with IECC building codes resulted in as much as $11,100 savings over the term of the mortgage.[130] In markets where energy costs have increased, investments in energy efficiency also cause savings to increase.

Both renters and landlords have been positively impacted by energy-efficiency measures incorporated into building code-driven green buildings.[131] Renters in green buildings typically see $145 per year in savings on energy costs alone, while landlords recover costs of energy-efficiency investments within an average of six years.[132] Savings associated with reduced life cycle costs,[133] which can impact both renters and landlord, are exemplified in the extended life of energy-efficient light bulbs and other energy-efficient technologies.[134]

Building energy codes can be especially useful for low-income households because they place the costs of code-mandated energy efficiency upgrades on landowners and builders with more resources to afford any additional costs. While critics point to increased costs associated with renovation and building as a downside of building energy codes, long-term savings can offset the upfront costs. Through thoughtful, locally-tailored building energy

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129. Research published in the 1980s suggested that more stringent building codes are correlated with an approximately five percent increase in housing construction costs. *See* Eli M. Noam, *The Interaction of Building Codes and Housing Prices*, 10 REAL ESTATE ECONS. 394, 402 (December 1982); *see also* Joseph Gyourko & Raven Molloy, *Regulation and Housing Supply*, 5 HANDBOOK OF REG'L & URBAN ECONS. 1289,1327-32 (2015).

130. *See* Ellen Vaughan & Jim Turner, *The Value and Impact of Building Codes*, ENVIRONMENTAL & ENERGY STUDY INSTITUTE (Sept. 30, 2013), https://www.eesi.org/papers/view/the-value-and-impact-of-building-codes.

131. Green buildings are those that, through design, construction, or operation, reduce and improve energy consumption. Features can include use of renewable energy, efficient use of energy and water, use of ethical and sustainable products, and improved air quality. *See What is green building*, WORLD GREEN BUILDING COUNCIL, https://www.worldgbc.org/what-green-building (last visited Mar. 13, 2019).

132. *See* Emily Chasan, *Green Buildings Saved Renters $72M, Fannie Mae Says*, BLOOMBERG, https://www.bloomberg.com/news/articles/2019-03-12/green-buildings-saved-renters-72m-since-2012-fannie-may-says (last updated Mar. 12, 2019).

133. Life cycle costs is an evaluation of total costs to own and operate an investment—in this context, thermal efficiency investments—and considers relevant costs like alternative building designs, materials, or practices and positive and negative environmental impacts. *See* SAM KUBBA, LEED PRACTICES, CERTIFICATION & ACCREDITATION HANDBOOK 205 (1st ed. 2009).

134. See discussion *supra* Part I.

codes, localities can increase energy efficiency while decreasing the energy burden for low-income households in their community.

C. Well-Communicated

One of the greatest barriers to increased use of energy efficiency technologies in low-income households is inadequate access to information about energy efficiency and programs supporting energy efficiency.[135] Access to information at the time of a home purchase or rental decision, and updated information throughout the occupant's tenure in the home, is vital to ensuring that more low-income households can take advantage of the benefits of increased home energy efficiency—and avoid crushing energy burdens. Building energy efficiency scorecards and neighborhood-specific report cards address both of these time periods, sale or rent and during occupancy, respectively. Requiring energy efficiency inspections for enrollment in utility-funded energy efficiency programs similarly educates citizens, increases participation in weatherization programs, and ensures that utility funding is effectively addressing the specific energy needs of each household.

1. Building Scorecards

Insufficient information about a particular building's energy efficiency attributes is one reason that building owners often fail to make cost-effective energy efficient improvements. Benchmarking building energy addresses this issue by ensuring owners are informed about their building's energy performance.[136] Many cities have adopted energy use disclosure ordinances, but most are targeted towards commercial buildings.[137] The requirements that do exist for residential disclosures primarily apply to multi-family buildings.[138] However, where these ordinances do exist, studies have found that mandatory disclosures of energy use significantly reduce energy

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135. *See* Reames, Reiner & Stacey, *supra* note 32.

136. Benchmarking, in the energy context, is an evaluation and disclosure of a particular building's energy performance in comparison to other similarly situated, surrounding buildings. *See* Olga V. Livingston, Trenton C. Pulsipher, David M. Anderson, Alex Vlachokostas & Na Wang, *An Analysis of Utility Meter Data Aggregation and Tenant Privacy to Support Energy Use Disclosure in Commercial Buildings*, 159 ENERGY 302 (September 2018).

137. *See Building Benchmarking, Rating, & Transparency*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, https://database.aceee.org/city/benchmarking-disclosure (last updated Jan. 2017).

138. *See id.*

consumption within four years.[139] Communities nationwide should require building scorecards at the time of building sale or rental of any single-family and multi-family residential buildings to inform potential occupants and the public about buildings energy use and efficiency ratings.

Information disclosure must be different for multi-family, single-family, and commercial buildings to protect privacy.[140] Building scorecards for larger multi-family dwellings should provide potential residents with an average monthly energy cost for each apartment lay-out, as well as an overall ENERGY STAR rating of the building.[141] Sharing an average energy cost ensures existing residents' privacy and anonymity is retained while still providing pertinent energy-use information. While large multi-family buildings allow for a disclosure of average energy use while still preserving privacy and anonymity, smaller multi-family and single-family building energy disclosures should only address the ENERGY STAR rating of that building to preserve the previous occupant's privacy.

The benefits of building scorecards extend not only to tenants and prospective homebuyers but to building owners as well. Providing scorecards to tenants and home buyers creates a more informed population that is in a better position to make educated decisions about where they can afford to live.[142] Building scorecards also motivate homeowners to make changes for their own benefit by highlighting just how much energy their home consumes and that there is often room for improvement. Former HUD Secretary Julián Castro promoted the idea of building scorecards, recognizing that "before property owners and managers can achieve measurable savings in the operating costs of their buildings, they need to understand just how much . .

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139. *See* Ting Meng, David Hsu & Albert Han, *Estimating Energy Savings from Benchmarking Policies in New York City*, 133 ENERGY 415, 419-22 (August 15, 2017).

140. *See* Livingston, Pulsipher, Anderson, Vlachokostas & Wang, *supra* note 136 (discusses how the aggregation of annual energy use for buildings can create privacy concerns for tenants because the building's total energy consumption can be divided by the number of meters to determine an estimate of one household's use and suggests that as the number of tenants in a given building decreases, the privacy concerns of the tenants outweigh the interest in energy disclosure).

141. ENERGY STAR rating is a screening tool to evaluate a building's efficiency with a score ranging between one and 100, a score of 75 or higher may be eligible for an ENERGY STAR certification. *See What is an ENERGY STAR Score*, ENERGY STAR, https://portfoliomanager.zendesk.com/hc/en-us/articles/211697117-What-is-an-ENERGY-STAR-score- (last visited Mar. 14, 2019).

142. *See Home Energy Efficiency Policies: Ratings, Assessments, Labels, and Disclosures*, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY 1, 2-7 (October 2018), https://aceee.org/sites/default/files/pdf/topic-home-energy-assessment.pdf [hereinafter ACEEE, *Home Energy Efficiency Policies*].

. energy consumption is costing them."[143] Additionally, building scorecards incentivize landlords and home sellers to make energy improvements to attract homebuyers or tenants. By creating a more competitive market, buildings that have disclosed expected energy use sell more quickly.[144]

Energy scorecards give municipal governments an effective tool for helping reduce energy burdens through encouraging investments in energy efficiency by creating an informed population of renters, buyers, and sellers. Building scorecards inform potential renters and home buyers about otherwise unforeseen energy costs, while also encouraging building owners to improve their building's energy efficiency. Additionally, the benefits extend to landowners who may save on operating costs after energy efficiency improvements by being informed about their building's energy efficiency. Providing energy-efficiency information in the form of energy-use data for large multi-family housing and ENERGY STAR ratings for small multi-family and single-family housing is an important tool for informing low-income households about expected energy costs and incentivizing investments in energy-efficiency upgrades.

2. Neighborhood-Specific Report Cards

Additionally, neighborhood-specific report cards provide households a way to compare their energy use and efficiency to surrounding households. These report cards, which would be compiled by local governments using information collected for energy efficiency scorecards at the time of sale or rental, allow electricity consumers to compare their energy use to that of their neighbors. By bringing the report cards to a neighborhood level, the general size and age of homes can be held relatively constant to make the comparison meaningful. Like building scorecards, report cards can address privacy concerns by providing aggregate, anonymous data. An energy-efficiency rating, plus local recommendations on how to improve energy efficiency, provides actionable, consumer-oriented information to encourage smart investments in energy-efficient technologies that nearby households may be using to spend less on utilities. Finally, report cards distributed in low-income neighborhoods should focus on providing information about financial assistance programs to help these households access energy efficiency resources available to them, such as WAP.

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143. *HUD Launches Utility Benchmarking in an Effort to Increase Energy and Water Efficiency and Save Costs*, U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT (Oct. 4, 2016), https://archives.hud.gov/news/2016/pr16-154.cfm.

144. *See* ACEEE, *Home Energy Efficiency Policies, supra* note 142.

Between 2009 and 2010, Massachusetts's electricity and gas provider, National Grid, ran a test program that provided customers with neighborhood energy reports.[145] The reports included a rating of their home energy efficiency as compared to similar residences, as well as tips on how to decrease consumption through conservation and energy-efficiency measures.[146] The program found that both electric and gas consumption decreased amongst participating households.[147] The decreased consumption is thought to be largely due to participants' home energy-efficiency improvements.[148] The program has continued and expanded throughout Massachusetts, with a 2016 report finding that it has saved utility customers nearly $70 million since inception.[149]

Report card experiments in India have found equally exciting results. One notable experiment provided households with energy-use report cards that compared their electricity use to their neighbors and provided tips for saving electricity. The study found that households that received the report cards were both more likely to participate in energy-efficiency programs and to reduce their overall energy consumption.[150] The tips, combined with the knowledge that their household could achieve the energy savings of similar households, motivated the participating households and gave them evidence that savings were in reach.[151] Another Indian study that shared comparative water use information through mobile applications in an effort to address the challenge of water conservation found similar conservation outcomes following information availability.[152]

Although past report card programs have not been directed specifically at low-income households, their promising results provide a great opportunity

145. See *Massachusetts Cross-Cutting Behavioral Program Evaluation*, PREPARED BY OPINION DYNAMICS CORPORATION FOR MASSACHUSETTS ENERGY EFFICIENCY ADVISORY COUNCIL 1, 1-51 (June 2011), http://ma-eeac.org/wordpress/wp-content/uploads/Cross-Cutting-Behavioral-Program-Evaluation-Volume-1-Final-Report-June-2011.pdf.

146. *See id.*

147. *See id.*

148. *See id.*

149. *See* Larry Rulison, *National Grid Reports Help Customers Cut Energy Bills*, TIMES UNION, https://www.timesunion.com/homestyle/article/Powerful-facts-6743621.php (last updated Jan. 8, 2016).

150. *See* Anant Sudarshan, *Nudges in the marketplace: The response of Household Electricity Consumption to Information and Monetary Incentives*, 134 J. OF ECON. BEHAVIOR & ORG. 320, 320-35 (2017).

151. *See id.*

152. *See* Amishi Nayar & Dr. S. Kanaka, *A Comparative Study on Water Conservation through Behavioral Economics based Nudging: Evidence from Indian City "A Nudge in time can save nine"*, 8 INT'L J. OF BUS. & SOC. SCI. 62, 62-66 (November 2017).

to decrease energy burdens for the households most in need of the benefits of such programs.

3. Energy-Efficiency Inspections

Another means of promoting information-based energy-efficiency improvements is through mandated energy efficiency inspections. Energy-efficiency inspections, also referred to as energy audits, identify areas of an individual home that provide the greatest opportunities for cost-effective energy-efficiency improvements.[153] These inspections can provide additional actionable information in the form of monthly savings assessments associated with different investments in energy efficiency.[154] Low-income households often do not participate in energy-efficiency inspections due to high costs and time constraints.[155] However, creating a utility-mandated, flexible program at no cost to low-income households would allow more households to access energy-efficiency inspections and take action based on their findings.

The requirement that participants in utility payment assistance and other energy-efficiency programs providing financial benefits partake in an energy-efficiency inspection is not novel. Participants in WAP, for example, are required to have an energy-efficiency assessment done on their home before taking advantage of the program's benefits.[156] Inspections can help households decide where to invest what funds they have in energy-efficiency upgrades. Additionally, inspections inform utility-funded weatherization programs on the best use of the program's investment to see the biggest increase in energy efficiency.

One of the potential issues with inspection requirements is that low-income households may work long or irregular hours that make scheduling inspections difficult. For the scheduling itself, programs should offer several options for scheduling, including via phone or internet, to provide flexibility and accessibility for different age groups and technological skill levels. To overcome the obstacles posed by long or irregular working hours, inspections should be offered during an array of days and times—not just during

153. *See Energy Audits*, THE AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, https://aceee.org/topics/energy-audits (last visited Mar. 16, 2019).

154. *See id.*

155. *See* Kenneth Gillingham & Tsvetan Tsvetanov, *Nudging Energy Efficiency Audits: Evidence from a Field Experiment*, 90 J. OF ENVTL. ECONS & MGMT. 303, 304 (July 2018).

156. *See Looking Beyond LIHEAP: Alternative Sources of Energy Assistance*, NATIONAL COUNCIL ON AGING 1, 1 (Apr. 2018), https://www.ncoa.org/wp-content/uploads/Alternative-Sources-of-Energy-Assistance.pdf.

weekday business hours—to accommodate the schedules of low-income households. Flexible scheduling options and varied hours of operation can ensure that the inspection itself is not something that results in a household from being unable to take advantage of energy efficiency programs they otherwise qualify for.

In summary, effective communication is key to a successful energy-efficiency program—both before and after Americans choose their home and how to invest in it. Building scorecards, neighborhood-specific report cards, and energy-efficiency inspections are all tools that can be used to ensure low-income households can make cost-effective, informed decisions to take advantage of energy efficiency programs and alleviate energy burdens.

D. Goal-Oriented

Other countries, most notably those in the European Union, have found success in motivating utilities to help their customers increase household energy efficiency by holding utilities to binding energy-efficiency goals.[157] Energy-efficiency goals directed at utilities should be set and administered at the state level for ease of administration and to allow enough flexibility to account for local conditions. State-level administration and monitoring should be used to discern which utility companies meet goals that qualify them for access to federal incentives. In addition to any goals established to qualify for federal incentives, states have the opportunity to set their own goals for energy efficiency. These state-level goals may be more aggressive than federal minimums and can be tied to high-impact incentives under state control, such as state utility commission-controlled utility rate levels. Finally, any goals that are set must remain static to eliminate unexpected costs for local governments, utilities, and households while enabling these stakeholders to plan for and invest in the future.

Some U.S. cities, such as Denver, San Francisco, and Washington, D.C., have set city-level energy-efficiency targets, but struggle to meet them.[158] Their small size, as compared to a state, makes them isolated and nimble enough to enact aggressive goals, but that can also be their downfall. Part of the issue with city-level targets is that many of the cities setting their own goals are also some of the fastest-growing cities.[159] When population influxes

157. *See Energy Efficiency Directive*, EUROPEAN COMMISSION (Apr. 1, 2017), https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive.

158. *See* Dan Boyce, *Despite Progress, Cities Struggle with Ambitious Climate Goals*, NATIONAL PUBLIC RADIO, INC. (Feb. 6, 2018), https://www.npr.org/2018/02/06/583625833/despite-progress-cities-struggle-with-ambitious-climate-goals.

159. *See id.*

hit cities, energy-efficiency targets can become untenable. These rapid changes result in an inability to maintain stable goals. As observed by energy consultant Sam Brooks, "[a] city will set very aggressive goals, it won't meet them, and then a few or five years later they just set new goals that are even more ambitious."[160] Ever-changing goals make long-term planning unrealistic, eliminating one of the most important benefits of goals.

An example of a state-level government setting more progressive energy efficiency standards and holding utilities to these goals is New York.[161] New York's Reforming the Energy Vision Connect (REV) encourages several market actors, including utilities, tech companies, investors, and distributed energy developers, to reduce New York state's overall energy consumption by twenty-three percent by 2030, among other goals.[162] Much of REV's success is thanks to the policy framework New York has adopted, which aligns utility financial interests with customer energy efficiency by applying market-based and outcome-based rewards for utilities.[163] One of these rewards systems is the Earning Adjustment Mechanism (EAM), which incrementally rewards utilities for meeting performance standards in areas including system efficiency and peak reduction, customer engagement, and energy efficiency.[164] New York's program encourages utilities to achieve the state-level energy-efficiency goals by financially rewarding utility progress. This approach has led to great success in engaging some of the largest utility

160. *See id.*

161. Under the guidance of Governor Andrew Cuomo, New York set energy-efficiency goals aimed at "accelerat[ing] energy efficiency by more than 40 percent over current forecasts and reduc[ing] energy consumption by 185 trillion Btu." New York has currently implemented energy efficiency standards for IOUs to achieve annual savings of three percent sales by 2025. *See* Lacey Johnson, *New York Boosts Efficiency Target, Makes Way for More Solar and Energy Storage*, GREEN TECH MEDIA, (April 24, 2018), https://www.greentechmedia.com/articles/read/new-york-efficiency-energy-storage-solar.

162. *See REV Objectives*, REV CONNECT, https://nyrevconnect.com/rev-briefings/rev-objectives/ (last visited Apr. 1, 2019) [hereinafter *REV Objectives*]; *see also* Josue Campos do Prado, Wei Qiao, Liyan Qu & Julio Romero Agüero, *The Next-Generation Retail Electricity Market in the Context of Distributed Energy Resources: Vision and Integrating Framework*, 12 Energies 491, 495 (February 2019).

163. *See REV Objectives, supra* note 162. *See Track Two: REV Financial Mechanisms*, https://nyrevconnect.com/rev-briefings/track-two-rev-financial-mechanisms/. (Link from the *REV Objectives* page)

164. Seven of the largest utility providers in the state have participated in EAM programs focusing on new and innovative ways to meet energy efficiency savings goals. *See Energy Efficiency*, REV CONNECT, https://nyrevconnect.com/innovation-opportunities-older/energy-efficiency/ (last updated Jan. 28, 2019) (among the utilities named are National Grid, Con Edison, Central Hudson, NYPA, NYSEG, RG&E, O&R, and PSEG-LI). *See id.*

providers in the state and improving the state's overall energy efficiency. Beyond the benefits received by all state residents, increased energy efficiency and resulting decreased energy burdens can have a great impact on the lives of the state's low-income residents.

When energy-efficiency goals are tethered to federal funding, states must hold utilities to those goals. Having a static goal is vital to achievability. If the goal moves continuously, as goals have in some U.S. jurisdictions, they are less likely to be met.[165] Also, static goals are crucial to the ability to plan on, and invest in, future energy-efficiency upgrades. Without being able to predict the costs and benefits of future energy-efficiency expenditures, local governments, utilities, and households cannot make prudent decisions on how to invest in energy efficiency to meet the set goals.

Conclusion

Low-income American households face disproportionately high energy burdens. These energy burdens are not only a major financial stressor, but in the most extreme cases can also lead to adverse health and safety outcomes. The most cost-effective, impactful way to help low-income households mitigate their energy burdens is through energy efficiency upgrades to their homes that decrease overall energy use in time.

Current policies and programs at the federal, state, and local levels are not effectively addressing low-income household energy burdens. One of the main reasons these programs are ineffective is that they do not invest enough resources in the area of greatest opportunity: energy efficiency. Inconsistent energy-efficiency policies, insufficient incentives to motivate utilities to invest in and promote energy-efficiency programs, high up-front costs, and a lack of information and resources are all barriers that an effective energy-efficiency policy must overcome. To address these barriers, energy-efficiency policies must be utility-funded, locally-tailored, well-communicated, and goal-oriented.

Increased utility responsibility for low-income energy efficiency programs through mandated carve-outs and national comparative rankings fosters stronger programs, thanks to an alignment of utility goals with low-income-customers' energy-efficiency needs. In addition to utilities' enlarged role, local governments can implement locally-tailored building energy codes to target the most cost-effective and impactful energy-efficiency improvements for their area and reduce up-front costs for low-income households by placing the financial burden of meeting these building codes

165. *See* Boyce, *supra* note 158.

upon building owners. Also, crucial to improving energy efficiency in low-income households is ensuring that such communities have access to building scorecards, neighborhood report cards, and building inspections that provide information about building energy use, the energy use of comparable households, and how individual households can increase their own energy efficiency. Lastly, a successful energy-efficiency program must have static, state-level goals that hold utilities accountable and provide monetary rewards for utilities that meet said goals.

Though low-income households face real and pressing challenges every day, their energy bill should not be among their main concerns. Implementing smart and effective energy-efficiency policies can lift the weight of heavy energy burdens from low-income households and enable Americans in low-income households to live happier, healthier lives.