

Here Comes the Sun: Bringing Efficiency and Renewable Energy Solutions to Affordable Housing in the U.S.

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ABSTRACT

This Note analyzes how energy efficient and renewable energy solutions currently impact low-income communities and how policies can be adapted to better serve this demographic. It focuses on weatherization, smart-metering, solar power, and net-zero energy buildings. Looking to innovative policies in states such as California, Texas, and Colorado, this Note explores: (1) how current energy policies impact low-income residents, (2) how emerging policies and technologies may impact low-income residents, and (3) how policies targeted more precisely towards low-income residents can not only lower costs but also empower these groups in less tangible ways. The Note concludes that current policies are impactful but are not aimed towards low-income residents, and therefore, fall short of benefiting them.

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INTRODUCTION

On Thursday, January 4, 2018, the “bomb cyclone” tore through the New York area.¹ By mid-Wednesday, over 8,000 residents of the New York City Housing

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1. Reuven Fenton, Michael Garland & Bruce Golding, *1,300 NYCHA Apartments Have No Gas and Heat During Blizzard*, N.Y. POST (Jan. 4, 2018), <https://perma.cc/U5CY-4YQR>.

Authority (“NYCHA”) had no heat.² In five public housing developments, heating was shut down altogether as the blizzard wreaked havoc, cancelling thousands of flights and shutting down ferries.³ Residents were forced to endure the freezing cold for days.⁴ In East New York, over 200 seniors lived without heating since the Tuesday before the storm.⁵ Residents of Redfern Houses in Queens had been losing heat on and off for a week, and then lost it all together before the storm hit.⁶ Residents used every blanket they had, dressed their children with everything in their wardrobes, and turned on their ovens to keep warm as they waited for heat to be restored.⁷ A spokesperson for the housing complex claimed they were informed about radiators going cold late Thursday morning; however, an announcement dated Tuesday, January 2, 2018 read “LOW OR NO HEAT PRESSURE . . . SORRY FOR THE INCONVENIENCE.”⁸ Since December of the previous year, heat and hot water complaints had “more than doubled.”⁹ The Mayor himself had admitted that “the challenge in our public housing buildings is that these are older buildings that honestly for decades did not get the kind of investment and maintenance they deserve.”¹⁰

Unfortunately, this is not a unique story. Across the country the individuals who die in fires or due to exposure are overwhelmingly poor. The individuals often live in affordable housing with inadequate heating systems and insulation and, therefore, are forced to rely on space heaters and open ovens for warmth and suffer through summers without air conditioning.¹¹ Low-income people in the United States are subject to indignities and struggles that should, at this point, be obsolete in our society. Substandard housing conditions are not just uncomfortable, they are downright inhumane. As the housing crisis worsens and people are unable to afford homes, the problem becomes more visible as homelessness is spiking in cities across the country.¹² Those who have housing often live in decaying, mismanaged buildings and pay disproportionately in comparison to their wages.¹³ Individuals who live in these buildings suffer in almost every way but, most notably, in their finances and health.¹⁴

2. Kate Randall, *America's Poor and Homeless Freeze in Winter Storm*, WORLD SOCIALIST WEB SITE (Jan. 5, 2018), <https://perma.cc/KY4L-U675>.

3. *Id.*

4. Fenton et al., *supra* note 1.

5. Randall, *supra* note 2.

6. *Id.*

7. Fenton et al., *supra* note 1.

8. *Id.*

9. *Id.*

10. *Id.*

11. Randall, *supra* note 2.

12. *The Gap: A Shortage of Affordable Homes*, NAT'L LOW INCOME HOUSING COALITION 4 (Mar. 2017), <https://perma.cc/D9NN-22SN>.

13. *Id.* at 5.

14. Ernie Hood, *Dwelling Disparities: How Poor Housing Leads to Poor Health*, 113 ENVTL. HEALTH PERSPS. 311, 312 (2005), <https://perma.cc/G2B3-VR3P>.

Inadequately equipped, inefficient, substandard housing is an endemic characteristic of the affordable housing market in the United States.¹⁵ As affordable housing grows increasingly limited, poor communities continue to be cordoned off from the rest of society, relegated to areas where others do not want to live.¹⁶ Gentrification and “urban revitalization” efforts have not just left out the poor, but have pushed them out.¹⁷ As a result, low-income individuals feel the effects of climate change much more strongly than others.¹⁸ It is no secret that poor quality housing and unstable housing situations contribute enormously to increased health problems and mortality rates and correlate with learning and other cognitive disabilities.¹⁹ Poorly maintained homes have serious impacts not only on people’s wallets but also on their health.²⁰ Keeping in mind that a large percentage of low-income individuals are the most vulnerable in our society—the elderly, the chronically ill, the disabled, and single parents—improving people’s lives through improving their housing would benefit a huge number of those most in need and, eventually, give those individuals a chance at upward mobility.²¹

Aside from its poor condition, affordable housing is extremely scarce, and the costs to maintain a home are steep. On average, there are thirty-five available units for every hundred renter households.²² For those who do have homes, many spend far more than their middle-class counterparts in housing and energy costs.²³ Energy costs have risen, and affordable homes are older and improperly weather-proofed.²⁴ Around sixty-five percent of public housing units were built before 1970, and, of those, almost all of the units are located in either the coldest or warmest climates.²⁵ Over eighty percent of U.S. Department of Housing and Urban Development (“HUD”)-assisted housing stock is between fifteen and thirty

15. James Krieger & Donna L. Higgins, *Housing and Health: Time Again for Public Health Action*, 92 AM. J. OF PUB. HEALTH 758 (2002).

16. See generally Hood, *supra* note 14.

17. ROBERT MARK SILVERMAN ET AL., AFFORDABLE HOUSING IN US SHRINKING CITIES: FROM NEIGHBORHOODS OF DESPAIR TO NEIGHBORHOODS OF OPPORTUNITY? 11 (2016); see also Lance Freeman & Jenny Schuetz, *Producing Affordable Housing in Rising Markets: What Works?*, 19 CITYSCAPE 217, 217 (2017).

18. Freeman & Schuetz, *supra* note 17, at 217.

19. *Impact of Substandard Housing on Health*, HEALTHY ROWHOUSE PROJECT, <https://perma.cc/T5YK-UU4P>; see also Stockton Williams & Dana L. Bourland, *Greener Homes, Greener Cities: Expanding Affordable Housing and Strengthening Cities Through Sustainable Residential Development*, in GROWING GREENER CITIES: URBAN SUSTAINABILITY IN THE TWENTY-FIRST CENTURY 106 (Eugenie L. Birch & Susan M. Wachter eds., 2008).

20. Hood, *supra* note 14, at 312.

21. See generally *Demographic Facts: Residents Living in Public Housing*, NAT’L CTR. FOR HEALTH IN PUB. HOUSING, <https://perma.cc/2EPD-9H79>.

22. *The Gap: A Shortage of Affordable Homes*, *supra* note 12, at 2.

23. See ENVTL. PROT. AGENCY, ENERGY EFFICIENCY IN AFFORDABLE HOUSING 1 (2011), <https://perma.cc/L4WB-P7KG>; see also Freeman & Schuetz, *supra* note 17, at 218.

24. DEP’T OF HOUS. AND URBAN DEV., PROMOTING ENERGY EFFICIENCY AT HUD IN A TIME OF CHANGE: REPORT TO CONGRESS 1, (2006), <https://perma.cc/54YD-TPNK>.

25. *Id.* at 2.

years old.²⁶ Not only do these units require increased energy consumption, but they were also built during a time of lower costs and less focus on energy saving and efficiency.²⁷ In 2006, the Environmental Protection Agency (“EPA”) found that “close to 40 million households spent 30 percent or more of their incomes on housing.”²⁸ The national average energy cost sits at around four percent of annual income, whereas for “single, elderly, poor, and disabled persons living on social security” the number is around nineteen percent.²⁹ Compounded with simple aging, these structures result in far greater energy cost burdens, reflected by the strikingly high proportion of income that low-income families dedicate to energy bills.³⁰

The affordable housing crisis is such a complex issue that it can be exceedingly difficult, if not outright impossible, to excise a single issue and address it in a vacuum. It is not a “one dimensional issue.”³¹ However, it is undeniable that energy waste, insufficient heating, inconsistent power, and sky-high energy bills have devastating impacts on tenants’ financial and physical health.

This Note argues that increasing energy efficiency and access to renewable energy for affordable housing to reduce energy costs for tenants would not only improve living conditions for low-income residents but also help the environment. This Note also argues that purely physical improvements are insufficient because low-income individuals are psychologically oppressed by their conditions and treatment by society.³² True improvements would integrate technological innovation with the act of bringing low-income individuals into conversations about emerging technologies that could give them agency and control over their living situations.³³ Lastly, this Note proposes that a holistic approach could begin to mend the entrenched psychological damage that disenfranchisement has done to poor communities by signaling their value and worth.³⁴

To successfully bring efficient and renewable energy solutions to low-income customers, policies have to reduce or eliminate issues so that developers and public housing officials are able to effectively implement improvements. The

26. *Id.*

27. *Id.* at 1–2.

28. *Id.*

29. *Id.* at 10.

30. Heather L. Schwartz et al., *Energy Efficiency as a Tool for Preservation of Affordable Housing*, RAND CORP. 9–10 (2019), <https://perma.cc/JDM3-UB75>.

31. Jessica Boehland, *Greening Affordable Housing*, 13(1) RACE, POVERTY & THE ENV'T 59, 59 (2006).

32. Isaac Prilleltensky & Lev Gonick, *Politics Change, Oppression Remains: On the Psychology and Politics of Oppression*, 17(1) POL. PSYCHOL. 127, 129 (Mar. 1996).

33. *Id.* at 130 (“[E]xternal forces deprive individuals or groups of the benefit of self-determination, distributive justice, and democratic participation.”).

34. Rochelle E. Lento et al., *The Future of Affordable Housing*, 20(2) J. OF AFFORDABLE HOUSING & COMMUNITY DEV. L. 215, 229 (2011); see also Prilleltensky & Gonick, *supra* note 32, at 127 (“A comprehensive analysis of oppression will emerge only from an interdisciplinary approach that integrates the political with the psychological.”).

primary hurdles are: (1) reducing the split incentives of renewable energy and (2) implementing policies that target low-income communities specifically rather than just tangentially benefiting them. These and two additional obstacles are explained below.

First, the split incentive of adding energy saving measures is arguably one of the primary issues holding affordable housing back.³⁵ Currently, developers and landlords who wish to install solar panels shoulder the costs of installing the products, but tenants are the only ones who enjoy the benefit of reduced energy bills.³⁶ As a result, landlords have little incentive to install solar panels or invest in other energy efficiency measures.³⁷ Similarly, in the reverse scenario where a landlord manages utilities, tenants have no incentive to save energy because they see no added costs for increased usage.³⁸ Resolving split incentives offers not just the possibility of providing low-income customers with reduced energy costs but also with increased implementation of renewable energy products.³⁹

Second, keeping low-income communities in mind as policies and technologies evolve is essential to making significant change. The grid is an aging system, with parts of it clocking in at over one hundred years old.⁴⁰ The grid's age, combined with increased demand, are huge contributors to black outs, power surges, and high energy bills.⁴¹ Increased energy needs and ever-evolving technological advances are putting even more strain on an already worn-out grid.⁴² Researchers estimate that replacing it could cost around five trillion dollars.⁴³ Some argue that the increased adoption of energy efficient solutions could actually be harming the aging power grid.⁴⁴ They also contend that as a result of increased adoption of photovoltaic ("PV") systems, individuals who do not use PV systems are subsidizing the costs of monitoring and maintaining the grid for those who only rely on it as a fallback, or when using it to sell their excess energy back to utilities via a process known as net metering.⁴⁵

Third, although many programs exist that encourage developer and homeowner investment in renewable energy sources, many do not require that savings

35. Schwartz et al., *supra* note 30, at 17.

36. *Id.* at 7–8.

37. *Id.*

38. *Id.*

39. *Id.* at 75.

40. Sarah Gerrity, *Understanding the Grid*, DEP'T OF ENERGY (Nov. 17, 2014), <https://perma.cc/UW4A-5FBW>.

41. PROMOTING ENERGY EFFICIENCY AT HUD IN A TIME OF CHANGE, *supra* note 24, at 2.

42. *Aging and Unstable, The Nation's Electrical Grid is 'The Weakest Link'*, NAT'L PUB. RADIO (Aug. 22, 2016), <https://perma.cc/4DAT-GPUC>.

43. Tsvetana Paraskova, *Replacing the US Electric Grid Could Cost \$5 Trillion*, BUS. INSIDER (Mar. 25, 2017), <https://perma.cc/52PZ-LE39>.

44. Troy A. Rule, *Solar Energy, Utilities, and Fairness*, 6 SAN DIEGO J. OF CLIMATE & ENERGY 115, 120 (2015).

45. *Id.* at 118.

be passed onto tenants.⁴⁶ Many building managers currently disperse electricity costs of common areas among tenants by calculating the price of individual energy bills with a formula based on the total bill for the building and the square footage of a tenant's unit.⁴⁷ The added expense of a PV system could significantly impact the already high cost of energy that low-income individuals face.

Finally, most programs focus primarily on individual issues, such as solar panels, weatherization, or energy subsidies. Although low-income customers would certainly benefit from accessing these resources, as of now, no program has taken a more holistic approach to address the intersection of poverty and environmentalism. Arguably, it should be a top priority, considering the higher rates of exposure to climate change and pollution that low-income people are forced to endure.⁴⁸ Prioritizing programs that work at this intersection have the potential to impact more people more deeply than the disjointed efforts currently in place.

I. COMPETING SOLUTIONS

Complicated, nuanced problems require solutions that can also be complicated and nuanced. There is no single way to fix energy efficiency and bring renewable energy to any one type of housing, let alone public and affordable housing. State-run programs are underfunded, owner-operated housing functions on paper-thin margins, and the structure of targeted incentive programs often means that lowering costs for tenants means lowering payment to landlords.⁴⁹ That said, as energy efficiency and renewable energy become essential parts of the conversation, solutions (from highly innovative to more straightforward) are being crafted and implemented. Part I explains the solutions of weatherization, smart metering, solar panel installation, and net-zero energy buildings that integrate multiple new technologies in new housing developments. Within the discussion about each solution, this Part also analyzes different jurisdictions' programs within these categories to assess how they are working to solve problems such as split-incentives, grid instability, tenant savings, and empowerment.

A. WEATHERIZATION

One of the simplest and most urgent solutions to reduce energy costs and improve energy efficiency for low-income customers is to bring already-built affordable housing up to the same standards as newer construction.⁵⁰ Lack of

46. *Id.* at 8, n.5.

47. Michael Tobias, *Should You Go For Direct Metering or Sub-Metering?*, N.Y. ENGINEERS, <https://perma.cc/X7WU-9Y3T>.

48. Gail D.A. Vittori, *Affordable Housing: Greening Affordable Housing*, 13 J. OF AFFORDABLE HOUSING & COMM. DEV. L. 458, 460 (2004) ("The leading edge of green affordable housing demonstrates that the desired price points can be achieved without cutting corners on a building's environmental/health performance.").

49. Schwartz et al., *supra* note 30, at 8.

50. ENERGY EFFICIENCY IN AFFORDABLE HOUSING, *supra* note 23, at 8.

weatherization and inefficient appliances are a huge drain on energy, spike energy bills, and pose great danger to individuals living in very hot and very cold climates. For example, the EPA estimates that heating costs represent over forty percent of energy consumption in a typical multi-family building.⁵¹ To weatherize a home, first, an assessment known as an “energy audit” is conducted, which determines where and how energy is being used and where it is being wasted.⁵² Energy audits help determine where heat or cool air is escaping the building so as to make optimal suggestions for weatherization retrofitting.⁵³ Installing better insulation, sealing windows, and replacing old appliances would be an excellent start to reducing cost, and reducing energy waste.⁵⁴ There are several solutions in place to track energy usage and maximize efficiency, including do-it-yourself approaches and state-sponsored energy audits.⁵⁵ Local governments across the United States have implemented energy assistance programs that include weatherization services in conjunction with the U.S. Department of Energy Weatherization Assistance Program (“DOE WAP”).⁵⁶ Each state sets their eligibility and can contribute funds that add to the federal funding.⁵⁷ Additional federal funding can be allocated through the Department of Health and Human Services Low-Income Home Energy Assistance Program (“LIHEAP”).⁵⁸

Critics assert that the cost of retrofitting homes for increased efficiency is more expensive than the money saved.⁵⁹ For example, the average cost of retrofits in Michigan is about \$4,600 per household, but the average energy savings for weatherized households is about \$223 per year.⁶⁰ These criticisms seem to miss the significance of \$223 in savings when an individual is severely cost-burdened and the impact of these savings over time. They also do not account for the costs of healthcare that may have been saved as a result of safer living conditions.⁶¹ Additionally, the ongoing problems of gentrification are making it impossible for individuals to afford their homes regardless of weatherization assistance programs in many circumstances.⁶² Strategies that allow for incremental payments and reduce up-front costs for low-income consumers have a higher chance of

51. ENERGY EFFICIENCY IN AFFORDABLE HOUSING, *supra* note 23, at 9.

52. *Id.* at 8–9.

53. *Id.*

54. *Id.* at 8–10.

55. *Id.*

56. *Where to Apply for Weatherization Assistance*, ENERGY.GOV, <https://perma.cc/KHX7-5RDU> (last visited Nov. 1, 2019).

57. *Id.*

58. *Low Income Home Energy Assistance Program (LIHEAP)*, DEP’T OF HEALTH & HUM. SERVS. OFF. OF COMMUNITY SERV., <https://perma.cc/7XYM-FXB5> (last visited Nov. 1, 2019).

59. Michael Greenstone & Catherine Wolfram, *Are the Benefits to the Weatherization Assistance Program’s Energy Efficiency Investments Four Times the Cost?*, ENERGY INST. AT HAAS (Oct. 6, 2015), <https://perma.cc/FAC7-5SND>.

60. *Id.*

61. *Id.*

62. Freeman & Schuetz, *supra* note 17, at 219.

being utilized and being successful.⁶³ Preserving existing affordable housing stock is central to addressing the housing crisis, in addition to new buildings.⁶⁴

Weatherization is a Band-Aid on a bullet wound, and much more needs to be done in order to successfully address the problem of cost-burdened low-income households. Targeted policies that both update decaying housing stock and facilitate revitalization without displacement could go a long way to improving housing and health for low-income individuals.⁶⁵ As “Green Housing” efforts in affordable housing become more common, weatherization efforts should not fall by the wayside but, instead, become an important part of the conversation. The lack of quality building that resulted in this need for weatherization programs should absolutely serve as a lesson to future developers and building managers that up-front costs are not the be-all and end-all for actual, sustainable affordable housing.⁶⁶

B. SMART METERING

An energy innovation known as “smart metering” is another proposed solution being implemented to help reduce energy waste and cost.⁶⁷ Smart meters “provide two-way communication between you and your utility.”⁶⁸ The “typical process” involves someone coming out to read the index on a meter and subtracting that amount from the reading taken in the previous visit.⁶⁹ On the other hand, buildings where a smart meter is installed allow the customer to access his or her own energy data.⁷⁰ Depending on the sophistication of the meter, energy usage can even be tracked by the hour.⁷¹ The utility company is also able to save money because it is able to track energy usage without physically sending someone out to read the meter.⁷² Streamlining communication between the utility company and individual customers helps the utility company avoid blackouts and maintain the reliability of the grid.⁷³ Additionally, the aggregated benefits of smart meters, known as the “smart grid,” allow customers to track peak hours when energy is most expensive, allowing them to gauge their energy usage for optimal budgeting.⁷⁴ The smart grid touts many other benefits, such as quicker power restoration,

63. Vittori, *supra* note 48, at 460.

64. See Schwartz et al., *supra* note 30; Freeman & Schuetz, *supra* note 17, at 224.

65. Vittori, *supra* note 48, at 461.

66. Williams & Bourland, *supra* note 19, at 110; see also Vittori, *supra* note 48, at 459–60.

67. See Elizabeth Doris & Kim Peterson, *Government Program Briefing: Smart Metering*, NAT'L RENEWABLE ENERGY LABORATORY (Sept. 2011), <https://perma.cc/DF3Q-8GJ6>.

68. *What is the Smart Grid?*, ENERGY.GOV, <https://perma.cc/P932-ZDM2> (last visited Nov. 1, 2019).

69. Erin R. Pierce, *Modern Smart Grid Offers Consumers the Power of Choice*, ENERGY.GOV (Feb. 7, 2011), <https://perma.cc/S46N-7DFW>.

70. *Id.*

71. *Id.*

72. *Id.*

73. *What is the Smart Grid?*, *supra* note 68.

74. *Id.*

reduced grid-maintenance costs for utilities that translate to customers, and reduced peak demands.⁷⁵

Another advantage of smart metering is its ability to pair with solar energy and other renewable energy resources, both large and small.⁷⁶ The advanced technology allows for practices such as “net metering” that allow individuals with personal systems, such as solar panels, to sell excess energy back to the grid at the retail price they paid.⁷⁷ This not only improves the stability of the grid, but also provides huge cost-saving measures for those with solar power.⁷⁸

The main issue is that because smart metering is not specifically designed to help low-income customers realize energy savings, there is a risk that implementation can negatively impact a vulnerable population.⁷⁹ Energy savings are maximized when individuals are able to reduce energy consumption at peak times, so those who do not have this option, such as people with energy inefficient homes that do not retain heat or cold or those with medical devices that have to run continuously, will potentially suffer.⁸⁰ Also, there are serious safety and privacy concerns with regard to the use of data that low-income consumers may not be able to avoid.⁸¹

The following section focuses on policies in California and Texas as well as any regulations set forth to determine the policies’ impacts on low-income individuals in affordable housing.

In California, smart meter programs are being rolled out across the state by multiple utility companies.⁸² The California Public Utilities Commission (“CPUC”) rolled out smart meter programs with Pacific Gas & Electric (“PG&E”), Southern California Edison (“Edison”), and San Diego Gas & Electric Company (“SDG&E”).⁸³ These programs installed smart meters and implemented programs in conjunction with the meters, with the goal of encouraging customers to reduce energy usage.⁸⁴ The CPUC approved PG&E’s “once in a generation system-wide retrofit” of smart meters in 2006.⁸⁵ In conjunction, CPUC also approved “voluntary Critical Peak Pricing Programs” for qualifying

75. *Id.*

76. *Id.*

77. Rule, *supra* note 44, at 117–18.

78. *Id.* at 118.

79. *Id.* at 119 (“[A]s its quantity of solar-using, net-metered customers grows, a utility sells less and less power and its revenue stream begins to shrink. To compensate for this drop in revenue, utilities typically must petition to increase the per-unit price of the electricity they sell.”)

80. *Smart Grids*, THE NEXT SYSTEM PROJECT (Aug. 18, 2016), <https://perma.cc/T3WB-WZKJ>.

81. *Id.*

82. *The Benefits of Smart Meters*, CALIFORNIA PUB. UTIL. COMM’N, <https://perma.cc/7XC6-VUGH> (last visited Nov. 2, 2019).

83. *Id.*

84. *Id.*

85. Public Utilities Commission of the State of California, Opinion Authorizing Pacific Gas and Electric Company to Deploy Advanced Metering Infrastructure (July 20, 2006), <https://perma.cc/AG9Q-8PJE>.

customers with a SmartMeter.⁸⁶ The program was intended to encourage reduction of electricity usage during high electricity load periods.⁸⁷ Similar programs were approved for Edison and SDG&E.⁸⁸ They all include opt-out provisions for residential customers and promised billions in net-benefits to consumers, as well as increased response time and better customer service.⁸⁹

In Texas, smart meters have been installed in a similar fashion. Certain utilities, such as Center Point Energy, have put significant sums forward to help low-income customers upgrade technologies so as to better benefit from the smart grid.⁹⁰

Privacy with respect to the data gathered from smart meters is an important concern for users. Real time readings broken down by the hour, by device, and by appliance usage are incredibly valuable in an ever-increasing internet-driven market, and they reveal information about a person's life in extreme and unprecedented detail.⁹¹ Smart meter readings can divulge when someone is home, asleep, or out of town, and unusual energy readings can be used to link individuals to drug crimes.⁹² As the leaders in smart grid technology, California and Texas have taken a similar approach to regulatory structure, especially with respect to privacy.⁹³ As a result, smart meter technology may prove problematic, particularly for individuals in rental housing and even more so in affordable rental housing. First, there is a possibility that law enforcement can access highly detailed information and utilize it to continue to aggressively police low-income communities. Second, it is still unclear to what extent anonymous data is shared, how anonymous it actually is, and whom it is shared with. Both states acknowledge that data will be disclosed when served with a valid subpoena.⁹⁴ For example, in 2013 the American Civil Liberties Union ("ACLU") revealed that SDG&E had disclosed the energy records of over 4,000 customers as a result of government subpoenas.⁹⁵ In some instances, a single subpoena can result in the disclosure of

86. *Id.*

87. *Id.*

88. Public Utilities Commission of the State of California, Decision Approving Settlement on Southern California Edison Company Advanced Metering Infrastructure Deployment (Sept. 18, 2008), <https://perma.cc/3TDU-KLPT>; Public Utilities Commission of the State of California, Opinion Approving Settlement on San Diego Gas & Electric Company's Advanced Metering Infrastructure Project (Apr. 12, 2017), <https://perma.cc/BY43-LEHB>.

89. Opinion Approving Settlement on San Diego Gas & Electric Company's Advanced Metering Infrastructure Project, *supra* note 88.

90. *Smart Meters*, CTR. POINT ENERGY, <https://perma.cc/5D9D-NJ3W> (last visited Nov. 9, 2019).

91. BK Gupta, *Dive into Data Analytics: Unlocking the Value of Smart Meter Data*, EEONLINE (March/April 2012), <https://perma.cc/EVH2-FMLW>.

92. Matt Cagle, *Call Logs? Try Kilowatts: Reports Reveal Demands for California Energy Data*, ACLU.ORG (June 18, 2013), <https://perma.cc/Y3UY-M3AX>.

93. *Privacy Protection Needed as Smart Grid Arrives*, ELEC. FRONTIER FOUND., <https://perma.cc/9QVQ-8N57> (last visited Nov. 9, 2019).

94. *Id.*

95. Cagle, *supra* note 92.

thousands of customers' energy data.⁹⁶ Those living below national poverty levels are already more likely to be involved in the criminal justice system.⁹⁷ The effects of additional government surveillance on groups that have already internalized poor treatment by these authority figures perpetuates oppressive cycles and intergenerational trauma.⁹⁸

Although neither state permits third parties to access data without permission from the consumer, both reserve the right to scrub the data of identifying information and pass it on anonymously.⁹⁹ The data request and release process delineated by the CPUC in 2014, for example, provides that “[t]hird-parties, e.g. Solar PV Installers . . . will analyze anonymized household level energy consumption and billing data to identify customers/households that may benefit from energy services.”¹⁰⁰ Customers will be notified that “trusted third-parties have developed household specific proposals.”¹⁰¹ Although the data was scrubbed of identifying information when given to the third parties, it still contains intimate details of people’s lives and is shared without requiring permission on the part of the consumer.¹⁰² Low-income individuals in affordable housing are at high risk of being taken advantage of, and little is being done to protect them.

Due to these serious privacy concerns, both California and Texas have permitted customers to opt out of smart meter installation.¹⁰³ Both require a one-time fee and a recurring monthly fee for analog meters to cover the cost of in-person readings.¹⁰⁴ These fees are likely to be cost prohibitive for low-income people and therefore make smart meters effectively mandatory for those who cannot afford to opt out. California’s fees are listed as a set-up fee of seventy-five dollars or less and a recurring fee of ten dollars or less.¹⁰⁵ Texas, on the other hand, has a one-time fee between \$171 and \$201 and monthly fees of \$32.80.¹⁰⁶ Considering that the maximum income level of a one-person household to qualify for assistance with home energy costs in California is \$26,049, but in Texas is \$15,175,

96. *Id.*

97. Paul Wright, *The Crime of Being Poor*, PRISON LEGAL NEWS (May 24, 2010), <https://perma.cc/62MJ-UP7M>.

98. Prilleltensky & Gonick, *supra* note 32, at 133.

99. *Frequently Asked Questions*, SMART METER TEX., <https://perma.cc/Z89H-7SYZ> (last visited Nov. 9, 2019).

100. Public Utilities Commission of the State of California, Order Instituting Rulemaking to Consider Smart Grid Technologies Pursuant to Federal Legislation and on the Commission’s Own Motion to Actively Guide Policy in California’s Development of a Smart Grid System, at 36–37 (May 1, 2014).

101. *Id.* at 37.

102. *Id.*

103. *Compare The Smart Meter Opt-Out Program*, PG&E, <https://perma.cc/AP24-H55N> (last visited Nov. 9, 2019), with *Smart Meters*, *supra* note 90.

104. *The Smart Meter Opt-Out Program*, *supra* note 103; *Smart Meters*, *supra* note 90.

105. *The Smart Meter Opt-Out Program*, *supra* note 103.

106. *Smart Meters*, *supra* note 90.

this price disparity is unusual.¹⁰⁷ In either state, low-income individuals are likely unable to opt out of any smart meter programs should they wish to, but more so in Texas, as the cost is prohibitive.¹⁰⁸ Many who choose to opt out have concerns with privacy and data-sharing or do not have technologies that are optimized for smart meters.¹⁰⁹ Federal entities, state power commissions, and utilities advertise the purpose of smart metering, aside from stabilizing the grid, as empowering consumers and allowing them to engage with their energy consumption.¹¹⁰ Cost-prohibitive opt-out provisions such as the one available in Texas do not promote empowerment or engagement from customers, but instead further sows feelings of coercion, disenfranchisement, and mistrust between low-income individuals and state authorities.¹¹¹

Smart meter policies in both California and Texas provide yet another example of promising solutions that have failed to be implemented with affordable housing occupants in mind. Those living in poverty continue to exist at the margins of policies that could be helping them and, instead, are treated differently and impacted negatively. Smart meters may help bring down costs, but they do so in a paternalistic manner by not giving low-income people a true opportunity to opt out. This is likely to perpetuate learned helplessness because people have their agency removed and are given solutions they did not ask for. These “repeated experiences of failure . . . help solidify apathy towards adverse living circumstances.”¹¹²

C. SOLAR ENERGY

Solar energy is a long-term solution to save on energy costs with a higher upfront cost, but it provides renewable energy and is the focus of many current innovative policies in energy. It can be installed directly on a roof, connected to a smaller group of structures, or be set up similarly to wind farms and distributed much in the same way as other energy through the grid.¹¹³ Solar panels, known as a “photovoltaic [or ‘PV’] system,” convert sunlight into electricity.¹¹⁴ PV systems installed near the location where they will be used are known as “Distributed Systems.”¹¹⁵ Distributed systems are defined as “systems that are installed at or

107. *Compare California Weatherization Assistance Program*, BENEFITS.GOV, <https://perma.cc/B5UF-KPLH> (last visited Nov. 9, 2019), with *Texas Weatherization Assistance Program*, BENEFITS.GOV, <https://perma.cc/V56B-N6ZH> (last visited Nov. 9, 2019).

108. *Smart Meters*, *supra* note 90.

109. Terrance Henry, *Want to Opt-Out of a Smart Meter in Texas? It Will Cost You*, STATE IMPACT (2013), <https://perma.cc/UG29-39PU>.

110. Doris & Peterson, *supra* note 67, at 2.

111. Prilleltensky & Gonick, *supra* note 32, at 134.

112. *Id.*

113. *Grid-Connected Renewable Energy Systems*, ENERGY.GOV, <https://perma.cc/252M-KUVG> (last visited Nov. 9, 2019).

114. *Solar Energy Glossary*, ENERGY.GOV, <https://perma.cc/262X-5TZR> (last visited Nov. 9, 2019).

115. *Id.*

near the location where the electricity is used,” and they are not limited to PV systems. PV systems also fall into the “Distributed Generation” category because they do not simply store energy but generate it on-site.¹¹⁶ Any power that comes from a distributed system is known as distributed power. Together, these technologies are known as “Distributed Energy Resources,” defined as “a variety of small, modular power-generating technologies that can be combined with energy management and storage systems and used to improve the operation of the electricity delivery system.”¹¹⁷

The cost of installing a PV system has dropped drastically, around 63% since 2011 and a further 18% from 2015 to 2016.¹¹⁸ The first million systems were installed from 1997 until 2016, but the second million were installed by 2018, demonstrating the exponential growth in popularity of the solar panel system.¹¹⁹ Generous federal incentive programs and tax credits further increased the appeal and accessibility of PV systems.¹²⁰

Providing individuals with PV systems would likely be the best way to realize cost savings in tandem with promoting renewable energy. However, the split incentive of installing PV systems presents the largest barrier to entry out of all the proposed solutions, as explained at the beginning of this paper. State efforts to promote the use of solar energy have varied greatly in their approaches, with some being more sensitive to individuals in affordable housing. This section looks at regulations, tax breaks, and other incentives designed to encourage investment in solar power in California and Texas. It then examines the states’ consideration of and impact on individuals in affordable housing and the extent to which the programs successfully converge the split incentives.

California is often thought of as leading the charge in renewable energy, with some of the most aggressive renewable energy goals in the country. Since 2002, the Renewables Portfolio Standard (“RPS”) has existed with the aim to increase the percentage of renewable energy to twenty percent of retail sales by 2017.¹²¹ The state’s impressive performance resulted in a new RPS goal of thirty-three percent by 2020, with new targets being implemented in 2015 and 2018 as a result of the program’s success.¹²² In 2018, the California Energy

116. *Id.*

117. *Id.*

118. *Solar Industry Research Data*, SOLAR ENERGY INDUS. ASS’N, <https://perma.cc/W9B3-YQXB> (last visited Nov. 9, 2019).

119. Andrew Savage, *1 Million Solar Strong, and Growing*, SOLAR ENERGY INDUS. ASS’N (May 3, 2016), <https://perma.cc/S8Q3-HKZ6>.

120. *See generally Federal Income Tax Credits and Other Incentives for Energy Efficiency*, ENERGY STAR, <https://perma.cc/J8JC-24R4> (last visited Nov. 9, 2019).

121. *California’s Renewables Portfolio Standard*, UNION OF CONCERNED SCIENTISTS, <https://perma.cc/4Z5A-EUNK>.

122. *Id.*

Commission unanimously approved a measure requiring all new homes to have solar power.¹²³ Municipal utilities also provide incentives for various energy efficient practices.¹²⁴ California's programs show huge promise in increasing usage of renewable energy but have yet to acknowledge the gap in access to renewables for low-income people. As such, it is unclear whether the programs are directly benefiting individuals living in affordable housing units.

At the state level, California has implemented several programs to facilitate installation and access of PV systems. First, the California Solar Initiative in 2007 was funded at two billion dollars and provided cash back for installation of solar energy systems to existing and new private, commercial, industrial, and agricultural properties.¹²⁵ Next, the Low-Income Weatherization Program ("LIWP") provides no-cost PV systems for single family homes and incentives for multi-family homes in disadvantaged communities.¹²⁶ The program is part of a statewide initiative to reduce greenhouse gas emissions, and it has a focus on low-income communities.

The California Solar Initiative's rebates programs for affordable housing fall under the Single Family and Multi-Family Affordable Solar Housing programs ("SASH" and "MASH").¹²⁷ Both programs are fully enrolled, indicating their success. The SASH program was relatively straightforward and provided families with cashback for installation of PV systems in their homes.¹²⁸ The MASH program was slightly more complex because it provided cashback per watt based on tenant savings.¹²⁹ The program, now fully enrolled, originally had two different tracks, but the unpopularity of Track 2 resulted in reallocation of Track 2 funds to Track 1.¹³⁰ Track 1 was "designed to provide fixed, up front, capacity based EPBB incentives," and it had different sub-categories depending on what load the PV system offsets and by how much.¹³¹ Track 1C applies to PV systems that offset common area load, non-Virtual Net Metering ("VNM") tenant load, or VNM tenant load with less than fifty percent tenant benefit, and it provides a rebate of

123. Ivan Pen, *California Will Require Solar Power for New Homes*, N.Y. TIMES (May 9, 2018), <https://perma.cc/S3DM-4WSV>.

124. See generally *Energy Efficiency & Rebates*, LADWP, <https://perma.cc/G5KP-3PWG> (last visited Nov. 10, 2019).

125. *About the California Solar Initiative*, GO SOLAR CAL., <https://perma.cc/5C8B-F9B5> (last visited Nov. 9, 2019).

126. *Low-Income Weatherization Program*, CAL. DEPT. OF CMTY. SERV. & DEV., <https://perma.cc/7QCG-JSTP> (last visited Nov. 9, 2019).

127. *Single Family Affordable Solar Housing*, GO SOLAR CAL., <https://perma.cc/L7FD-HENS> (last visited Nov. 9, 2019); *Multi-Family Affordable Solar Housing*, GO SOLAR CAL., <http://perma.cc/3AAE-TT8B> (last visited Nov. 9, 2019).

128. *Single Family Affordable Solar Housing*, *supra* note 127.

129. *Multi-Family Affordable Solar Housing*, *supra* note 127.

130. GO SOLAR CAL., CALIFORNIA PUBLIC UTILITIES COMMISSION MULTIFAMILY AFFORDABLE SOLAR HOUSING PROGRAM HANDBOOK 7-8 (2015), <https://perma.cc/RTC2-CPZE>.

131. *Id.*

\$1.10 per watt. Track 1D is a PV system that offsets a VNM tenant load with fifty percent or more tenant benefit and provides \$1.80 per watt.¹³²

Now that many state-run programs have utilized all available funds, municipal utilities such as Los Angeles Department of Water and Power are offering further incentive programs like net metering, feed-in-tariffs, and rebates to promote renewable energy sources and green development.¹³³ These programs are arguably the most innovative and seem to present some of the best resolutions for the split incentive problem plaguing PV systems in rental housing. Three programs in particular offer promising solutions: Feed-in-Tariffs, on-bill financing, and the Shared Solar Pilot Program.¹³⁴ Each program seeks to solve a different aspect of the split incentive conundrum. Feed-in-Tariffs provide payments to consumers who deliver excess power generated by their PV systems back to the grid.¹³⁵ The new Shared Solar Pilot program, rolled out in 2019, “allows residential customers living in multifamily dwellings to participate in LA’s thriving solar economy as well as fix a portion of their electric bill against rising utility costs.”¹³⁶ Finally, on-bill financing, provided through Property Assessed Clean Energy (“PACE”) financing, helps property owners “fund energy efficient upgrade projects through an assessment on their property tax bills.”¹³⁷

Texas, on the other hand, has a deregulated energy market.¹³⁸ In deregulated energy areas, there are three separate businesses involved in providing electricity: retail electric providers, distribution and transmission businesses, and power generators. Customers have the ability to select their preferred retail provider.¹³⁹ Utility companies are responsible for distribution and transmission of electricity and remain regulated.¹⁴⁰ Power generation companies produce electricity.¹⁴¹ These companies are unregulated but have to operate within the outlined market rules and register with the Public Utility Commission of Texas.¹⁴²

As a result of deregulation, and likely due to Texas having no state income tax, very few programs are available to renters seeking to make PV systems accessible

132. *Id.*

133. *Solar Incentive Program*, LADWP, <https://perma.cc/PFM2-AWV4> (last visited May 17, 2019); *Electric Rate Schedules*, LADWP, <https://perma.cc/3QBF-8MZC> (last visited Nov. 9, 2019); *Feed-in Tariff (Fit) Program*, LADWP, <https://perma.cc/7HUT-54DA> (last visited Nov. 9, 2019).

134. OFF. OF CMTY. SERV. & DEV., *LOW INCOME WEATHERIZATION PROGRAM: COMMUNITY SOLAR PILOT PROGRAM 3* (2018), <https://perma.cc/V2E2-DBJ9>; *Feed-in Tariff (FiT) Program*, *supra* note 133.

135. *LOW INCOME WEATHERIZATION PROGRAM*, *supra* note 134; *Feed-in Tariff (Fit) Program*, *supra* note 133.

136. *Solar Incentive Program*, *supra* note 133.

137. *Los Angeles County PACE*, LOS ANGELES CTY., <https://perma.cc/5LXP-YSYT> (last visited May 21, 2019).

138. *The Ultimate Guide to Texas Electricity Deregulation*, ELEC. CHOICE, <https://perma.cc/M39L-2UX9> (last visited May 23, 2019).

139. *Id.*

140. *Id.*

141. *Id.*

142. *Id.*

to them—especially not those in affordable multi-family housing.¹⁴³ Furthermore, there are no state-funded tax credits available for installing PV systems.¹⁴⁴ Some more regulated areas, such as Austin, have similar programs to California, but the majority of Texas does not have these available.¹⁴⁵ Instead, renewable, affordable energy in Texas has a different face: the free market. Many power generation companies exist that offer either wholly or partially renewable energy, and competition amongst retail energy providers keeps prices down.¹⁴⁶ The average monthly consumption in kilo-watt per hour (“kWh”) in Texas is around 1,112, and residential bills for that usage averaged around \$122.47, around 11c per kWh.¹⁴⁷ Quotes for 1000 kWh are as low as 7.5c in areas such as Houston, putting bills as low as seventy-five dollars without including the cost of energy transmission, which was no more than ten dollars per billing cycle.¹⁴⁸ In California, the monthly average was 554 kWh, with an average bill for that usage at \$101.49, or 18c per kWh.¹⁴⁹ On paper, this is great news for low-income individuals living in Texas, but lack of opportunities to benefit from solar power the way homeowners can means that over time, Texas customers will remain dependent on energy companies and continue to pay monthly bills. For California customers, increased access to PV systems will likely reduce reliance and usage of power from the utility companies and place it into the hands of the customers, despite the higher up-front energy costs. Additionally, net metering programs will allow customers to sell back excess power to the grid, further lowering costs.

Solar power is a very promising innovation that seems to attract everyone. Environmentalists are pushing for broader implementation, and opportunities for low-income customers are expanding greatly. The main obstacle remains the inaccessibility of solar technology for people who do not have money to invest up-front. As the cost of solar panels decreases, and as green housing develops and hopefully becomes the norm, multi-family affordable housing buildings will come equipped with PV systems. This could have the effect of leaving more funding open to install PV systems on buildings that were built before these technologies were available.

D. NET ZERO ENERGY HOUSING & SOLAR GARDENS

Viewed at in isolation, none of these policies appear to be truly innovative or even particularly promising with respect to improving the energy available to

143. *Id.*

144. *Id.*

145. *Community Solar*, AUSTIN ENERGY, <https://perma.cc/P235-DCHR> (last visited May 5, 2019).

146. *The Ultimate Guide to Texas Electricity Deregulation*, *supra* note 138.

147. *Where We Serve*, SMARTENERGY, <https://perma.cc/NJN5-6YP2> (last visited Jan. 30, 2020).

148. *See* PUB. UTIL. COMM’N OF TEX., THE POWER TO CHOOSE, <https://perma.cc/M9L8-NRPF> (last visited Jan. 2, 2020) (search Houston area codes).

149. *2018 Average Monthly Bill-Residential*, EIA.GOV, <https://perma.cc/H84G-W9E2> (last visited Nov. 9, 2019).

those living in affordable housing. However, in aggregate, the policies create a strong platform upon which exciting solutions are developing to answer these complex questions. These more out-of-the-box projects take advantage of the growing modern infrastructure and available tax incentives to bring green living to those in affordable housing. Two examples are particularly relevant and exciting: Zero-Energy Buildings and Community Solar Gardens.

One of the most novel solutions for reduction of energy costs is Net Zero Energy Buildings (“ZNE”).¹⁵⁰ A ZNE “produces enough renewable energy to meet its own annual energy consumption requirements, thereby reducing the use of non-renewable energy in the building sector.”¹⁵¹ These buildings boast “energy independence” for occupants, in addition to benefitting the environment.¹⁵² By generating power in the same location as the power is used, ZNEs use low-to-zero-source energy, that is, “energy needed to deliver energy to a site including the energy that may be lost or wasted in the process of generation, transmission and distribution.”¹⁵³ These buildings bring all proposed solutions together under one roof. ZNEs are built well from the beginning, with excellent insulation and state-of-the-art appliances to ensure that as little energy as possible is wasted. The focus on energy efficiency brings down the total energy needs of the building, which in turn ensures that any renewable energy sources installed are able to provide adequate power. When the ZNEs do not provide enough power, they are still connected to other renewable energy sources as well as the grid.¹⁵⁴ The concept behind ZNEs is that “it is almost always easier to save energy than to produce energy.”¹⁵⁵ Focusing on energy efficiency rather than renewables comports well with the needs of low-income customers, who primarily need cost-saving measures. However, by wasting less energy, there are tangential environmental benefits, particularly if implemented on a large scale such as affordable housing, where approximately twenty million individuals are considered cost burdened and low income.¹⁵⁶

Investing in ZNEs as the structures for future affordable housing development would likely save local governments immense amounts of money in the long term, eventually compensating for the higher up-front cost of the sophisticated renewable energy sources and building materials. Currently, the federal government spends between three and thirty-four dollars per capita on its LIHEAP

150. P. Torcellini et al., *Zero Energy Buildings: A Critical Look at the Definition*, NAT’L RENEWABLE ENERGY LAB. 1 (June 2006), <https://perma.cc/7V2R-RNL2>.

151. U.S. DEP’T OF ENERGY, A COMMON DEFINITION FOR ZERO ENERGY BUILDINGS 1 (Sept. 2015) <https://perma.cc/N9Q7-ZUFG>.

152. Torcellini et al., *supra* note 150, at 2.

153. *Net Zero Energy Buildings*, WHOLE BLDGS. DESIGN GUIDE (last updated Aug. 8, 2016), <https://perma.cc/7T7C-UYYZ>.

154. A COMMON DEFINITION FOR ZERO ENERGY BUILDINGS, *supra* note 151, at 7.

155. Torcellini et al., *supra* note 150, at 3.

156. Philip Oliff et al., *Federal Funding for Low-Income Energy Assistance Highest in New England, Upper Midwest*, PEW TRS. (Feb. 21, 2018), <https://perma.cc/3CQC-59W4>.

program.¹⁵⁷ The government is paying for the electricity bills caused by substandard housing. The government is essentially burning money that could instead be going towards new developments that may someday dramatically reduce or even eliminate the need for energy bill subsidies.

Another benefit to building ZNEs for affordable housing would be the increased awareness they would generate within low-income communities. People who can barely afford their bills are unlikely to be able to prioritize renewable energy and environmentalism in their lives. However, having housing that puts a focus and value on renewable energy could encourage and inspire those living in it and be a source of education and empowerment. Housing development that pushes the envelope like this could also serve to promote education about environmentalism amongst those who do not live in affordable housing and bridge the gap between communities.¹⁵⁸ As more cities implement green and sustainable housing practices for new development,¹⁵⁹ these same principles should be required for affordable housing without allowing any corners to be cut.

Innovative programs that integrate other public services and benefits are also much more promising.¹⁶⁰ This can include large-scale investment in solar power that also provides job training in the renewable energy industry. The Denver Housing Authority (“DHA”) championed one such initiative and “launched the nation’s first housing authority-developed, owned and operated 100% Low Income Community Solar Garden.”¹⁶¹ Community Solar Gardens are similar in concept to the Shared Solar Pilot program. However, the DHA project goes beyond reducing utility costs and improving energy efficiency and addresses the root cause of poverty—earning power.¹⁶² In a symbiotic relationship, the solar garden will provide power to affordable housing units, and those living in affordable housing who want to “enter the booming solar industry” will have access to job training and employment.¹⁶³ Because the DHA owns the solar garden, there is less risk that it will shift gears and increase prices in order to ensure higher profits the way private companies may.¹⁶⁴ The success of Denver’s program hints at the potential success a similar program could have if the housing provided was also centered around energy efficiency and renewables by providing ZNE residences.

157. *Id.*

158. Lento et al., *supra* note 34, at 227.

159. Williams & Bourland, *supra* note 19, at 111.

160. Lento et al., *supra* note 34, at 232.

161. Kathie Zipp, *Denver Housing Authority Launches Community Solar Garden*, SOLAR POWER WORLD (Oct. 24, 2017), <https://perma.cc/FX9A-32YK>.

162. *Id.*

163. *Id.*

164. John B. Goodman & Gary W. Loveman, *Does Privatization Serve the Public Interest?*, HARV. BUS. REV., Nov.–Dec. 1991, at 26, 28; *see, e.g.*, Paul Buchheit, *8 Ways Privatization Has Failed America*, COMMON DREAMS (Aug. 5, 2013), <https://perma.cc/CTX3-SLQD>.

Research has shown the “‘profound, directly measurable’ physical and mental health outcomes” for those in low-income communities.¹⁶⁵

II. FEATURED SOLUTION, DEFENSE

Based on the varied and expansive options that exist to help reduce energy costs for individuals in affordable housing, the future looks bright. With widespread implementation of certain measures, amendment of others, and the revocation of policies which disproportionately harm low-income individuals, moving towards a more sustainable energy market is not only possible, it is likely. Together, these initiatives would improve access to renewable energy, lower energy waste, and reduce the cost of utilities. This Part reviews the four solutions discussed in sections I.A–D above and provides suggestions for how they can be improved to benefit low-income residents.

Current weatherization programs have several key issues. First and foremost is how difficult they are to access. For this solution to be possible, individuals first need to know about the programs, have access to internet or other technology, and navigate the pages to figure out who can serve their area. Then the application process begins, followed by inspection, energy auditing, and retrofitting.¹⁶⁶ The expectation that these programs will be easily discovered and sought out without a massive promotional campaign is laughable because the information is piled under mountains of links, dead ends, and confusing legal language. Even if individuals do find and seek out weatherization and take the time to go through the process of applying and multiple home visits, construction remains a dilemma. Better outreach is essential to allow for wider-spread implementation of the service.¹⁶⁷ Additionally, improved education following weatherization on energy saving measures is essential to ensuring the success of the programs because often increased energy consumption compensates for the reduced waste and negates the cost effectiveness of the programs.¹⁶⁸ Despite these shortcomings, energy efficiency and renewability programs should still prioritize retrofitting all affordable housing with improved weatherization, upgraded appliances, and efficient heating and cooling systems. Federal standards requiring all new housing should include these requirements as well as promote maintenance and renovation efforts for affordable housing.

Second, programs to implement smart meters should continue to be put forward, but customer data should be much more heavily protected. Any opt-out

165. Williams & Bourland, *supra* note 19, at 113.

166. ENERGY EFFICIENCY IN AFFORDABLE HOUSING, *supra* note 23, at 8.

167. *Harnessing the Conversation: Raising Awareness of Weatherization Assistance Program Using Social Media*, NAT'L ASS'N FOR STATE CMTY. SERV. PROGRAMS 2, <https://perma.cc/BJ2D-Y5X8> (last visited Nov. 11, 2019) (discussing social media as an outreach tool to promote LIHEAP).

168. Meredith Fowlie, *Are the Benefits to the Weatherization Assistance Program's Energy Efficiency Investments Four Times the Costs?*, ENERGY INST. BLOG (Oct. 6, 2015), <https://perma.cc/9J7U-5869>.

fees should be based on individual's income rather than set at a flat rate so as to make opting out feasible for low-income individuals. Smart meter programs have seen a lot of success in areas where they have been implemented on a broad scale, but individuals' valid security concerns must be addressed in order for the devices to receive acceptance. These measures must consider the socioeconomic position that people are in and give all individuals equal opportunity to refuse the meters. The current cost for opting out is too high, especially in Texas, and in particular with the low income of individuals living at or below the poverty line. This discrepancy and inequity serve to further promote disenfranchisement¹⁶⁹ rather than doing what the smart meter campaign claims: giving individuals more control over their energy usage and utilities.

Third, federal and state measures should be rolled out on a larger scale to allow individuals in affordable housing to install PV systems, with a particular focus on reaching those in multi-family affordable housing. Greater installation of PV systems would have the most significant impact on utility costs and access to renewable energy. Access to PV systems is the ideal solution for long-term energy savings, increased reliance on renewable energy, and empowerment. California's Shared Solar program paired with its net metering initiative is the optimum solution for providing PV systems to those individuals who struggle the most to benefit from them—those in multi-family affordable housing. Shared solar incentives combined with new federal standards in affordable housing that require PV systems or a PV-ready structure would be the best options. As home ownership becomes increasingly inaccessible and city populations swell, multi-family rental housing is likely to make up a huge percentage of housing.¹⁷⁰ Additionally, steady increases in government reliance on mixed-income housing to satisfy affordable housing demand guarantees that many individuals relying on affordable housing solutions will be renters in multi-family buildings.¹⁷¹ Thus, ensuring PV systems for those buildings will cover a huge number of energy customers in the United States, serving the dual goals of utility cost reduction and environmental consciousness.

Regulatory structures or the lack thereof, such as in Texas, can help lower costs of service as well as offer renewable energy. However, they straggle behind in one key category—empowerment. As demonstrated, the lack of regulation and state income tax results in extremely limited options, if not outright nonexistent programs, to provide PV systems to multi-family housing complexes. Therefore, low-income individuals continue to be dependent on the grid and are forced to make substantial payments to power companies for most, if not all, of their lives.

169. Prilleltensky & Gonick, *supra* note 32, at 130.

170. Joint Ctr. for Hous. Stud. of Harv. U., *Rental Housing Stock*, in AMERICA'S RENTAL HOUSING 2017, 13 (2017), <https://perma.cc/FSH8-3U55> (“[M]ultifamily units account for 61 percent of the nation’s rental stock”).

171. *The Gap: A Shortage of Affordable Homes*, *supra* note 13, at 10.

Although utility bills may be lower, individuals remain tethered to energy companies and reliant on those services. Texas has the significant benefit of a deregulated, competitive market and a low cost of living, so individuals can at least access renewable energy for the same price as non-renewable energy. However, the system does not address the cost burden of those utility bills for low-income people. It is a system that has a secondary benefit for low-income consumers, but it is not designed for them. For this reason, the renewable energy and solar power programs implemented by California have a better chance of actually making impacts on low-income individuals who need a drastic reduction in monthly expenses and better local environments. Solutions must be tailored to low-income people's needs in order to work optimally. Programs need to prioritize cost reduction and facilitate widespread installation of PV systems in low-income buildings. Ultimately, affordable housing solutions have to go deeper than slapping a few solar panels on a roof. Giving low-income individuals access to energy efficient homes with renewable energy sources is a way of addressing the long-standing damage of racism that has come in the form of environmental racism.

Lastly, in a perfect world, this means ZNEs for all, manned by a Community Solar Garden, the picture of a utopian future. This may not be realistic in the immediate future, but it is not impossible. Programs such as the Shared Solar Pilot Program and the DHA Community Solar Garden offer a glimpse into how renewable energy can be brought to low-income consumers without being cost prohibitive. Working together with net metering programs, Feed-in-Tariffs, and on-bill financing, PV systems can be a realistic energy source without significant increase in construction costs for developers. These same incentives, along with federal tax incentives, can also motivate building owners to install solar panels on multi-family buildings.

CONCLUSION

The ideal solution would provide practical benefits while increasing empowerment and knowledge of different energy-saving options, so as to enable customers to make their own choices, rather than force one-size-fits-all solutions. A major issue throughout the history of both affordable housing and many other public service programs has been the paternalistic manner in which they are imposed on people. These styles of government programs perpetuate the cycle of poverty by causing learned helplessness as a result of powerlessness.¹⁷² Those who learn that they are not going to be heard when they ask for what they need, but instead are going to be given what others feel is most important, will eventually stop asking.¹⁷³ This level of distrust between the government and those depending on it is a hallmark of oppressed groups who have experienced repeated

172. Prilleltensky & Gonick, *supra* note 32, at 130.

173. *Id.*

poor treatment. The best solutions are not just going to provide clean and efficient energy but will provide a tangible value as well as acknowledge the inherent value of the people affected. Energy efficiency and renewable energy sources are centers of innovation and revolution in the modern world, and they can take that role in affordable housing too. One of the most damaging effects of substandard housing has been to send a clear message to low-income people that they are not worth the investment. These messages are heard loud and clear. When individuals hear that they are unworthy for long enough, they eventually believe it.¹⁷⁴ Giving people the dignity of an affordable, comfortable home would more than likely have effects far beyond any tangible, measurable impacts. The government has a responsibility to its most vulnerable. It should be responsible for progressive, aggressive policies to improve the nature of affordable housing. The moral obligation is reinforced by the financial imperative to improve people's lives and care for the environment. Policies like these do not just give people energy, they give people power.

174. *Id.*