

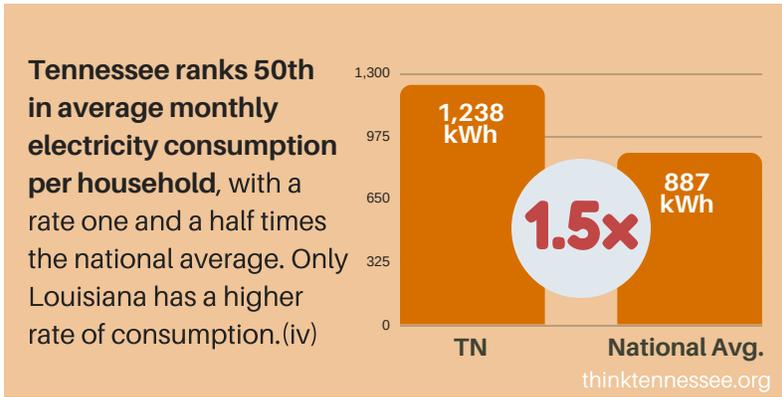
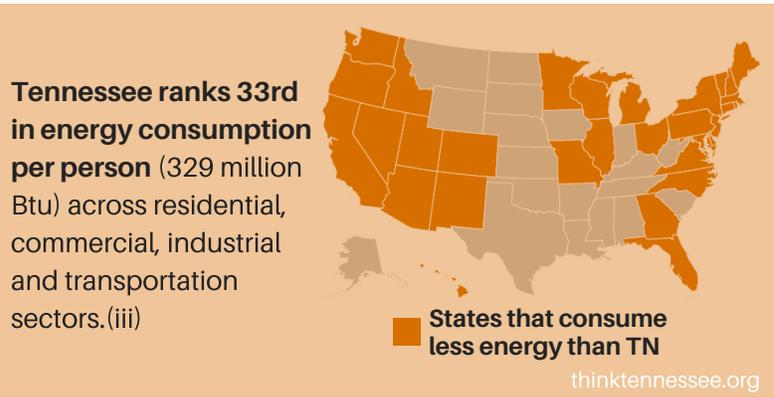


# State of Our State: Environment and Energy

## Tennessee's Families Pay Some of the Highest Electricity Bills in the Country

**Tennessee families use and pay more for electricity than most Americans.** The state ranks 33rd in overall energy consumption, 50th in residential electricity consumption and 46th in residential electricity bills. Tennessee also lags behind in energy efficiency (29th), solar energy (25th), wind energy (38th) and corporate access to renewable energy (44th).

**While it is not the only factor, the absence of policies encouraging the development and use of renewable energy sources is a key contributor to these disappointing rankings.** In contrast to most states, Tennessee policymakers have limited authority over state energy policy. Instead, the Tennessee Valley Authority (TVA), a federal utility, generates electricity for 99.7% of Tennessee and sets much of the state's energy-related policy.(i) To improve Tennessee's national standings, cut costs for families and reduce greenhouse gas emissions and pollution, federal and state leaders should consider adopting a policy agenda that prioritizes energy efficiency and renewable resources.(ii)

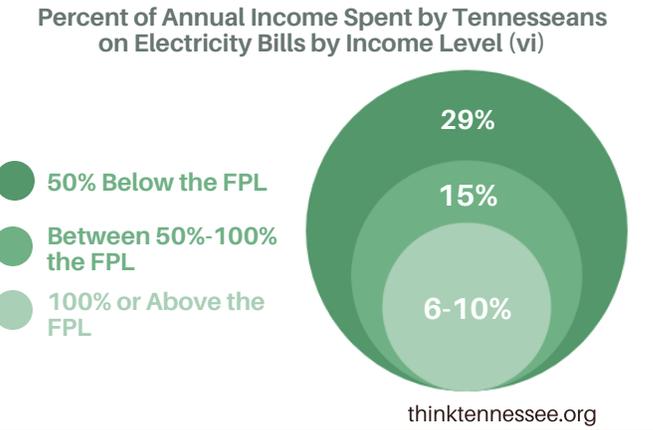


Tennessee families pay some of the highest electricity bills in the country. **The state ranks 45th in residential electricity bills with an average monthly bill of \$129**, nearly \$20 more than the average American household, even though the state ranks 9th in the price of electricity (10.4 cents per kWh in 2016).(v)

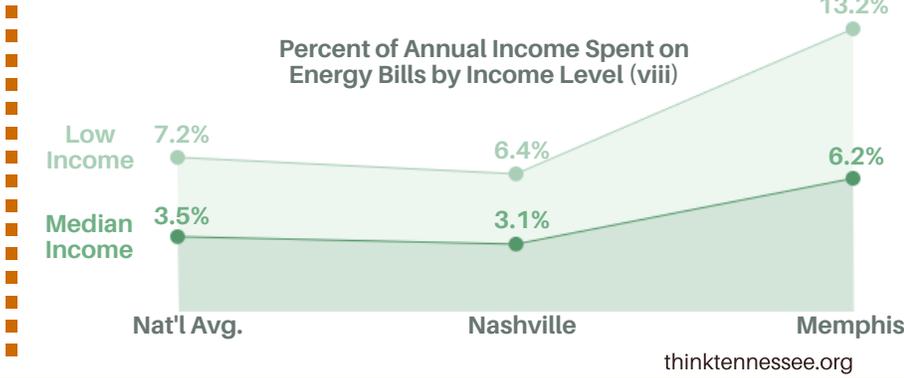


## Low-Income Tennesseans Spend a Disproportionate Amount of Their Income on Residential Electricity

Residential electricity bills are a particular burden for Tennesseans below the Federal Poverty Level (FPL).



Across the 48 largest U.S. cities, low-income households spend twice as much of their income on home energy bills than median-income households. **Memphis has the highest median- and low-income energy burdens of any large U.S. city.**(vii)



# Tennessee is Falling Behind on Solar Energy, Wind Energy and Corporate Renewable Procurement

Tennessee ranks in the bottom half of states (29th) on the American Council for an Energy Efficiency Economy's (ACEEE) combined score for electricity efficiency; fuel economy standards; building energy efficiency; combined heat and power efficiency; state government-led initiatives; and appliance standards.(ix)

## Solar Energy

Tennessee ranks 25th in solar energy, with 237 MW of solar capacity installed, about a quarter of the average national capacity (1,098 MW).(x) Only 0.3% of the state's power comes from solar energy.(xi) TVA offers a limited solar program for residential and commercial properties that requires customers to sell all of their solar power to TVA. In 2017, TVA reduced the rates customers receive for this program.(xii)

### Who is doing better in solar energy?



## Wind Energy

Tennessee has more wind-power potential than most Southern states.(xiii) Yet, the state ranks 38th in wind energy and is home to a single wind farm with only 27 MW of installed wind capacity.(xiv) To increase capacity, TVA relies largely on wind farms in IL, KS and IA.(xv) In 2017, the Tennessee state legislature imposed a yearlong moratorium on the construction, operation, expansion or redevelopment of wind-energy facilities.(xvi)

### Who is doing better in wind energy?



## Corporate Renewable Procurement

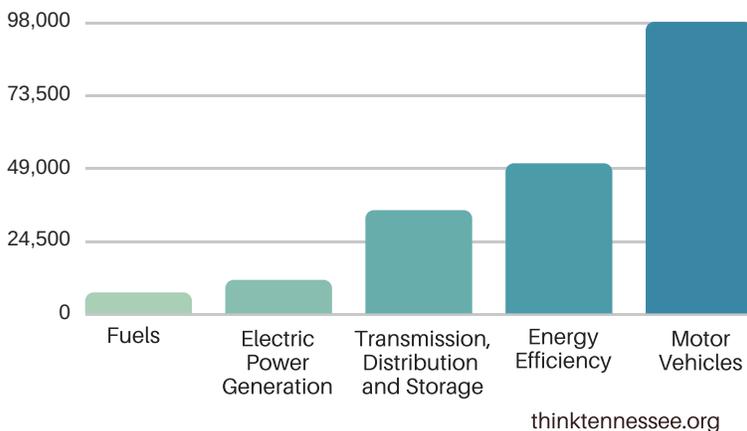
Tennessee ranks 44th in access to renewable energy for corporations.(xvii) Corporations with significant presence in Tennessee are driving demand for renewable power.(xviii) Many companies consider the availability of renewable energy for their operations when deciding whether to locate or expand in any state.(xix)

### Who is doing better in corporate renewable procurement?

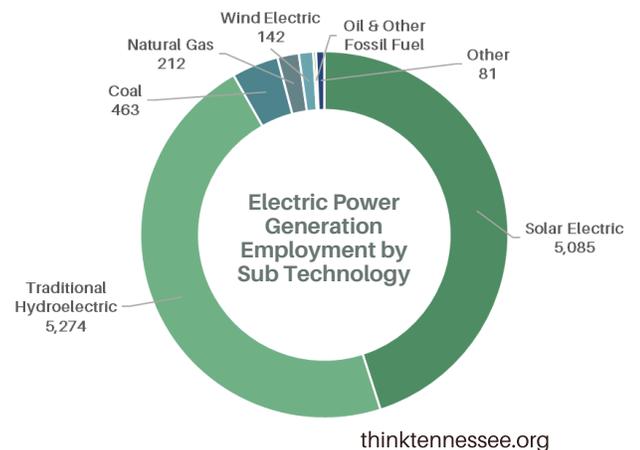


# Investment in Energy Efficiency Provides Jobs and Cost Savings for Thousands of Tennesseans

Of the five economic sectors assessed by the U.S. Department of Energy, the energy efficiency industry provides more jobs in Tennessee (50,451) than any energy sector apart from motor vehicles (97,056).(xx)



The solar industry provides more jobs in Tennessee (5,085) than any electricity-generation source other than hydropower (5,274).(xxi) These jobs are widely dispersed across the state and serve a variety of local communities.



Tennessee has the potential to **save 21 million MWh in electric energy efficiency by 2035, enough to power nearly two million homes.** Existing programs will only allow the state to reach 30% of this savings potential.(xxii)



Investing in cost-effective home energy efficiency upgrades could also **save single-family homes in Tennessee 26% of their annual energy use** and hundreds of dollars in utility bills. For example, replacing an electric furnace with a high-efficiency heat pump would cost about \$2,000 but would save a household in Tennessee nearly \$1,000 per year.(xxiii) Investment in energy efficiency, such as whole-home retrofits, can be especially impactful for low-income residents, lowering the disproportionate amount they spend on energy bills by as much as 35%.(xxiv)

## ***How is Tennessee Addressing Energy Efficiency?***

Tennessee Department of Environment and Conservation (TDEC) programs are designed to educate and provide technical and financial resources for energy-efficiency efforts across the state. Examples include:



TDEC released a **manual on single- and multifamily low-income energy efficiency** in May 2018. The manual serves as a planning blueprint for low-income energy-efficiency programs that could be utilized by local utilities as well as governmental and community partners.(xxv)



**The Tennessee Energy Education Initiative** promotes awareness of energy efficiency, renewable energy, energy management, and sustainable transportation options to individuals and organizations throughout the state by collaborating with various stakeholders to support the execution of targeted outreach events and to provide technical assistance to the residential, commercial, industrial, and/or public energy sectors. (xxvi)



**The Tennessee Energy Efficiency Loan Program** provides low-interest loans to commercial and industrial businesses and local governments for the implementation of energy-efficient and renewable-energy improvements. The program has a budget of \$35 million, with separate \$15 million commitments from the state and TVA, plus \$5 million from Pathway Lending, who operates the revolving loan fund program.(xxvii)



**The Energy Efficient Schools Initiative** provides grants and loans to fund energy efficient projects in schools and provides technical expertise to improve classroom efforts in energy conservation.(xxviii)



**EmPower TN** is Governor Bill Haslam's initiative for reducing the state's energy consumption and costs for publicly owned and managed facilities through energy efficiency projects and energy management systems. The initiative has established a utility data management system and has dedicated \$35.4 million to implementing 33 energy efficiency projects across 64 state-owned facilities. (xxix)

TDEC Office of Energy Programs also provides education and outreach for industrial assessment centers and has obtained federal funding for efficiency projects in wastewater treatment facilities, local jurisdictions, public schools and public housing.

## ***Lessons from Other States: Renewable Energy Standards, PACE, Solar Systems and On-Bill Programs***



### **Renewable Energy Portfolio Standards**

29 states have adopted renewable energy portfolios standards (RPS). **North Carolina is the only Southern state that has adopted a mandatory RPS**, which requires 12.5% of energy produced by investor-owned utilities (IOUs) to be from renewable sources by 2021. North Carolina also set a separate, lower percentage for cooperatives and municipal utilities.(xxx)

TVA serves several electric membership cooperatives in North Carolina and satisfies the North Carolina renewable portfolio standard obligations on their behalf.(xxxi)



### **Property Assessed Clean Energy (PACE) Program**

**34 states allow PACE, a program that helps finance energy-efficiency improvements to commercial and/or residential properties.** PACE has led to job creation, increased property values and higher business profits resulting from lower operating costs.(xxxii)

Arkansas, Florida, Kentucky, Texas and Virginia all have active commercial PACE programs, while North Carolina and Alabama have recently passed PACE-enabling legislation; Georgia's program is in development. Tennessee is one of four other Southern states (Louisiana, Mississippi and South Carolina) lacking action on PACE programs.(xxxiii)



### **Net Metering**

**38 states, including North Carolina, South Carolina and Virginia, have mandatory state net metering policies,** which give residential and commercial customers who have installed solar panels more control over their energy production and consumption by allowing them to **send excess electricity back into the grid and receive a credit on their utility bills.** In addition to saving customers money, it also reduces the amount of energy produced by fossil fuels. Moreover, metering can also help to benefit local economies, as it creates jobs for installers, electricians and solar manufacturers.(xxxiv)

TVA has declined to adopt a net metering policy,(xxxv) making Tennessee one of the few states in the country that does not allow this common practice.(xxxvi)



### **Community Solar Programs**

Community solar programs increase access to clean, renewable energy by allowing customers without rooftop solar systems to subscribe to a larger solar project and receive credit for energy generated from that facility. 36 states have at least one active community solar project,(xxxvii) and 16 states, including North Carolina, have passed legislation to establish community solar as a required source of renewable energy.(xxxviii)

TVA offers only limited opportunities for electric cooperatives and municipal utilities to participate in community solar programs. Participating co-ops and municipal utilities have to win a bidding process, and TVA controls the number of annual participants.(xxxix)



### **Pay As You Save® (PAYS®) On-Bill Energy Efficiency Programs**

A number of Southern states, from Kentucky to North Carolina to Arkansas, have implemented PAYS, a program that **helps homeowners and renters of all income levels access energy-efficiency upgrades.** With PAYS, utilities invest upfront in upgrades and then recover costs gradually through opt-in fixed charges on customers' monthly energy bills. PAYS programs can provide immediate savings for customers and sustained cashflow for utilities.(xxxx)

## ***How Might Tennessee Increase Customer Choice and Energy Efficiency?***

Tennessee leaders should consider a number of options:



**Enable PACE through bipartisan legislation.** Legislation filed in 2017 by Rep. Staples (D-Knox) and Sen. Dickerson (R-Davidson) would permit local governments to establish PACE-financing programs for installation or improvements meant to decrease water and/or energy usage in qualifying commercial, industrial and residential property.(xxxxi)



**Encourage business growth and customer cost savings by expanding energy-efficiency and solar programs.**

- Encourage electric cooperatives and municipal utilities to implement on-bill energy-efficiency financing programs like PAYS.
- Lead by example expanding investment in efficiency and solar for state buildings.
- Support local government energy-efficiency and renewable-energy standards.



**Adopt renewable energy policies that boost the state economy by creating jobs and saving consumers money.**

- Join a majority of states in either adopting renewable portfolio standards or voluntary renewable energy goals.
- Use the state's economic development program to recruit businesses that prioritize efficiency and renewable energy.

## NOTES AND REFERENCES

- li) Tennessee Valley Authority, "TVA in Tennessee", available at <https://www.tva.gov/About-TVA/TVA-in-Tennessee>.
- (ii) Wisner, R., G. Barbose, J. Heeter, T. Mai, L. Bird, M. Bolinger, A. Carpenter, G. Heath, D. Keyser, J. Macknick, A. Mills, and D. Millstein. 2016. A Retrospective Analysis of the Benefits and Impacts of U.S. Renewable Portfolio Standards. Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory. NREL/TP-6A20-65005. <http://www.nrel.gov/docs/fy16osti/65005.pdf>. See also, National Conference of State Legislatures, "State Renewable Portfolio Standards and Goals," (August 2, 2017) available at <http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>.
- (iii) The U.S. Energy Information Administration calculates overall energy consumption from the following sources: electricity, natural gas, petroleum, coal, nuclear, and renewable and alternative fuels, See U.S. Energy Information Administration, "Rankings: Total Energy Consumed per Capita, 2015 (million Btu)," available at <https://www.eia.gov/state/rankings/?sid=TN#/series/12>.
- (iv) U.S. Energy Information Administration, "Residential Average Monthly Electricity Bill, Consumption, and Price, by State, by Sector," (November 6, 2017) available at [https://www.eia.gov/electricity/sales\\_revenue\\_price/pdf/table5\\_a.pdf](https://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf).
- (v) Ibid.
- (vi) Fisher, Sheehan & Colton, The Home Affordability Gap 2017: Tennessee (April 2018), available at [http://www.homeenergyaffordabilitygap.com/03a\\_affordabilityData.html](http://www.homeenergyaffordabilitygap.com/03a_affordabilityData.html). In this study, "low-income" is calculated with respect to the Federal Poverty Level
- (vii) Ariel Dreihobl and Lauren Ross, "Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities," (April 2016) available at <http://aceee.org/sites/default/files/publications/researchreports/u1602.pdf>. This study calculates "low-income" as 80% of area median income (AMI), data calculated by the Department of Housing and Urban Development.
- (viii) Ibid.
- (ix) American Council for an Energy-Efficient Economy, "The State Energy Efficiency Scorecard" (September 28, 2017) available at <http://aceee.org/state-policy/scorecard>.
- (x) Solar Energy Industries Association, "Solar State by State," available at <https://www.seia.org/states-map>.
- (xi) Solar Energy Industries Association, "Tennessee Solar," available at <https://www.seia.org/state-solar-policy/tennessee-solar>.
- (xii) Tennessee Valley Authority, "Green Power Providers," available at <https://www.tva.com/Energy/Valley-Renewable-Energy/Green-Power-Providers>.
- (xiii) U.S. Department of Energy, "U.S. Installed and Potential Wind Power Capacity and Generation," Office of Energy Efficiency & Renewable Energy, WINDEXchange, available at <https://windexchange.energy.gov/maps-data/321>
- (xiv) American Wind Energy Association, "U.S. Wind Energy State Facts," available at <https://www.awea.org/resources/statefactsheets.aspx?itemnumber=890&navItemNumber=5067>.
- (xv) Tennessee Valley Authority, "Wind Energy Contracts," available at <https://www.tva.gov/Energy/Valley-Renewable-Energy/Wind-Energy-Contracts>.
- (xvi) Public Chapter No. 825, TN-HR 1731, 110th General Assembly (2018).
- (xvii) Retail Industry Leaders Association, Information Technology Industry Council and Clean Edge, Inc., "Corporate Clean Energy Procurement Index: State Leadership and Rankings" (January 2017) available at <http://www.rila.org/sustainability/RetailEnergyManagementProgram/Documents/RILAITICEIndex.pdf>.
- (xviii) David Gardiner and Associates, "Renewable, Climate Commitments Drive Clean Energy Purchases," available at [https://www.dgardiner.com/wp-content/uploads/2017/10/DGA-Clean-Energy-Access\\_Whitepaper\\_R9.pdf](https://www.dgardiner.com/wp-content/uploads/2017/10/DGA-Clean-Energy-Access_Whitepaper_R9.pdf).
- (xix) Corporate Renewable Energy Buyers' Principles, "They Buyers' Principles," available at <https://buyersprinciples.org/>.
- (xx) Transmission, distribution and storage employs (34,704), electric power generation 11,285 and fuels 7,062. Source: U.S. Department of Energy, 2017 US Energy and Jobs Report State Charts 2, available at <https://www.energy.gov/downloads/2017-us-energy-and-employment-report>
- (xxi) Ibid.
- (xxii) 21 million MWh is equivalent to 21 billion kWh. The average annual electricity consumption in a single residence in 2016 was 10,766 kWh (see <https://www.eia.gov/tools/faqs/faq.php?id=97&t=3>). Source: U.S. Department of Energy, "State Level Electric Energy Efficiency Potential Estimates," Office of Energy Efficiency & Renewable Energy, (May 2017) available at [https://www.energy.gov/sites/prod/files/2017/05/f34/eprl\\_state\\_level\\_electric\\_energy\\_efficiency\\_potential\\_estimates\\_0.pdf](https://www.energy.gov/sites/prod/files/2017/05/f34/eprl_state_level_electric_energy_efficiency_potential_estimates_0.pdf).
- (xxiii) National Renewable Energy Laboratory, "Tennessee Residential Energy Efficiency Potential," available at <https://resstock.nrel.gov/factsheets/TN>.
- (xxiv) Ariel Dreihobl and Lauren Ross, "Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities," (April 2016) available at <http://aceee.org/sites/default/files/publications/researchreports/u1602.pdf>.
- (xxv) Tennessee Department of Environment and Conservation, "Single & Multifamily Low-Income Energy Efficiency Program Resource Manual," (May 2018) available at [https://www.tn.gov/content/dam/tn/environment/sustainable-practices/low-income-energy-efficiency/2018-5-1--TDEC\\_Low-Income\\_Energy\\_Efficiency\\_Program\\_Resource\\_Manual.pdf](https://www.tn.gov/content/dam/tn/environment/sustainable-practices/low-income-energy-efficiency/2018-5-1--TDEC_Low-Income_Energy_Efficiency_Program_Resource_Manual.pdf).

- (xxvi) Tennessee Department of Environment and Conservation, "Tennessee Energy Education Initiative," available at <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo-/programs-projects/programs-and-projects/energy-tennessee-energy-education-initiative.html>.
- (xxvii) Tennessee Department of Environment and Conservation, "Tennessee Energy Efficiency Loan Program," available at <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo-/programs-projects/programs-and-projects/tennessee-energy-efficiency-loan-program.html>.
- (xxviii) Tennessee Efficient Schools Initiative," available at <https://www.tn.gov/eesi/about-us.html>.
- (xxix) Tennessee Department of Environment and Conservation, "EmPower TN," available at <https://www.tn.gov/environment/program-areas/energy/state-facility-utility-management--sfum-/empower-tn-energy-efficiency-projects.html>.
- (xxx) National Conference of State Legislatures, "State Renewable Portfolio Standards and Goals," (August 2, 2017) available at <http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>.
- (xxxi) The North Carolina Utilities Commission, "Annual Report Regarding Renewable Energy and Energy Efficiency Portfolio Standard in North Carolina Required Pursuant To G.S. 62-133.8(J)," (October 1, 2017) available at <http://www.ncuc.commerce.state.nc.us/reports/repreport2017.pdf>.
- (xxxii) PACENation, "PCE Programs Near You," available at <http://pacenation.us/pace-programs/>.
- (xxxiii) Ibid.
- (xxxiv) Solar Energy Industries Association, "Net Metering," available at <https://www.seia.org/initiatives/net-metering>.
- (xxxv) Federal Register citation: TVA, Notice of Determination on the PURPA Standards Set Forth in the Energy Policy Act of 2006, 72 Fed. Reg. 44911 (August 9, 2007), [http://152.87.4.98/purpa/pdf/federal\\_register\\_notice\\_determinations\\_epact.pdf](http://152.87.4.98/purpa/pdf/federal_register_notice_determinations_epact.pdf).[http://152.87.4.98/purpa/pdf/federal\\_register\\_notice\\_determinations\\_epact.pdf](http://152.87.4.98/purpa/pdf/federal_register_notice_determinations_epact.pdf).
- (xxxvi) National Conference of State Legislatures, "State Renewable Portfolio Standards and Goals," (August 2, 2017) available at <http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>.
- (xxxvii) Solar Energy Industries Association, "Community Solar," available at <https://www.seia.org/initiatives/community-solar>.
- (xxxviii) Shared Renewable HQ, "USA Shared Energy Map," available at <http://www.sharedrenewables.org/community-energy-projects/>.
- (xxxix) Tennessee Valley Authority, "Distributed Solar Solutions," available at <https://www.tva.gov/Energy/Valley-Renewable-Energy/Distributed-Solar-Solutions>.
- (xxxx) Clean Energy Works, "Pay As You Save® (PAYS®) harnesses a proven utility investment model to offer virtually all consumers cost-effective energy building upgrades," available at <http://cleanenergyworks.org/blog/pays-financing/>.
- (xxxxi) Property Assessed Clean Energy Act, HB 0464, 109th General Assembly (2017); Property Assessed Clean Energy Act, SB 0794, 109th General Assembly (2017).

