

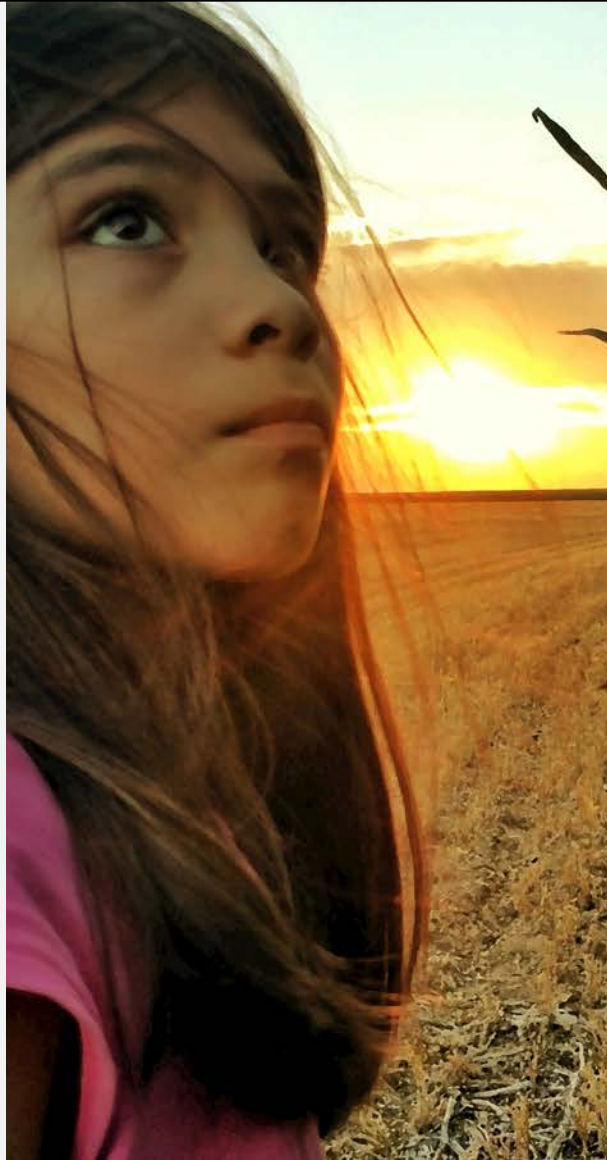


Access to Solar for Low-Income Households

Prepared for:

City of Austin Resource Management Commission
June 2019

About TEPRI



Mission:

Inspire lasting energy solutions

Approach:

Link community voices with science, data,
and innovative partnerships

Deliver best available information to
decision-makers

Outcomes:

Energy poverty reduction

Economic development

Community well-being

Our Work



RESEARCH & EVALUATION

Advance collective knowledge about low-income consumers and their relationships to energy.



DECISION TOOLS

Develop tools to help stakeholders make more informed decisions about serving energy needs.



STAKEHOLDER FORUMS

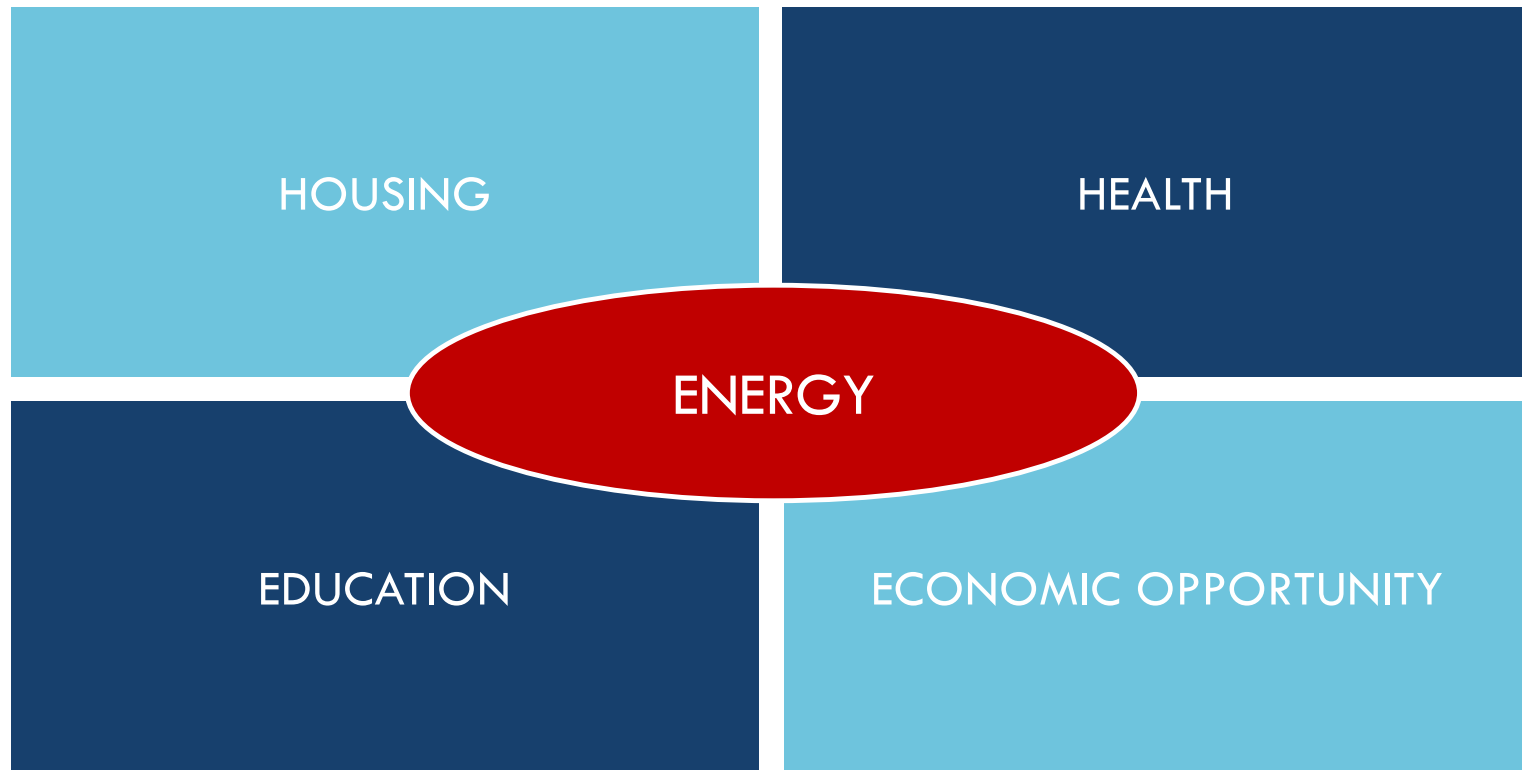
Connect professional peers from power sector, social services, and housing.



OUTREACH & EDUCATION

Reinvent energy consumer engagement for more effective programs.

Holistic approach: How can energy promote *self-sufficiency*.



Energy Poverty

Energy poverty describes a situation in which a low-income household cannot meet its **basic energy needs** to maintain a **healthy** lifestyle.

This situation may be related to problems of **accessibility**, **affordability**, or **awareness**.

When more than 10% of household income goes towards energy costs, it is an indication of **energy poverty**.

Household Income

Total household income (before taxes) for the same 12 month period



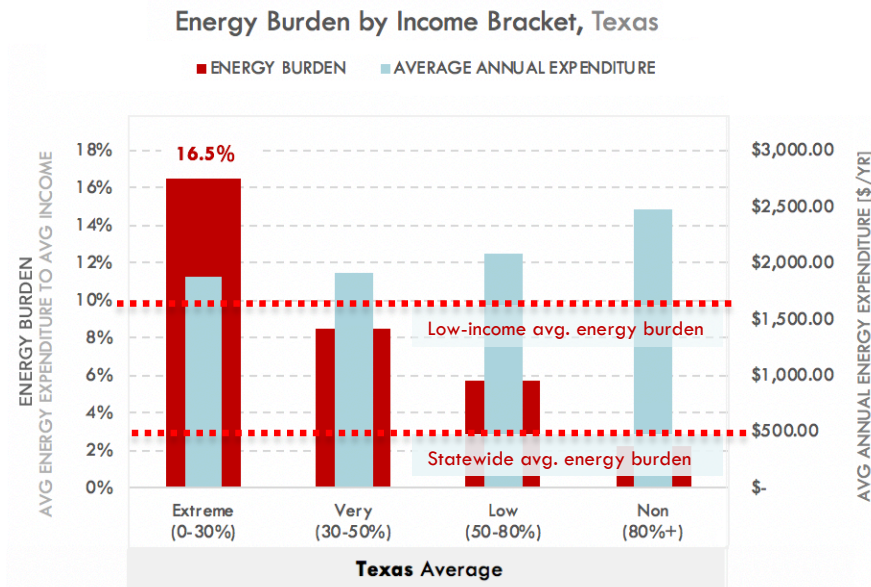
Energy Expenditures

All household energy expenses over a 12 month period, including electricity, utility gas, and bottled fuel

It does not tell us who is going without basic energy services whether because of affordability, awareness, or accessibility.

Energy Burden in Texas

This chart compares the energy burden average for Texas across the income brackets.

**41%****Low-income Population**

Of the 9+ million households in Texas, 41% are 0-80% AMI (~3.8 million)

10%**Low-income Energy Burden**

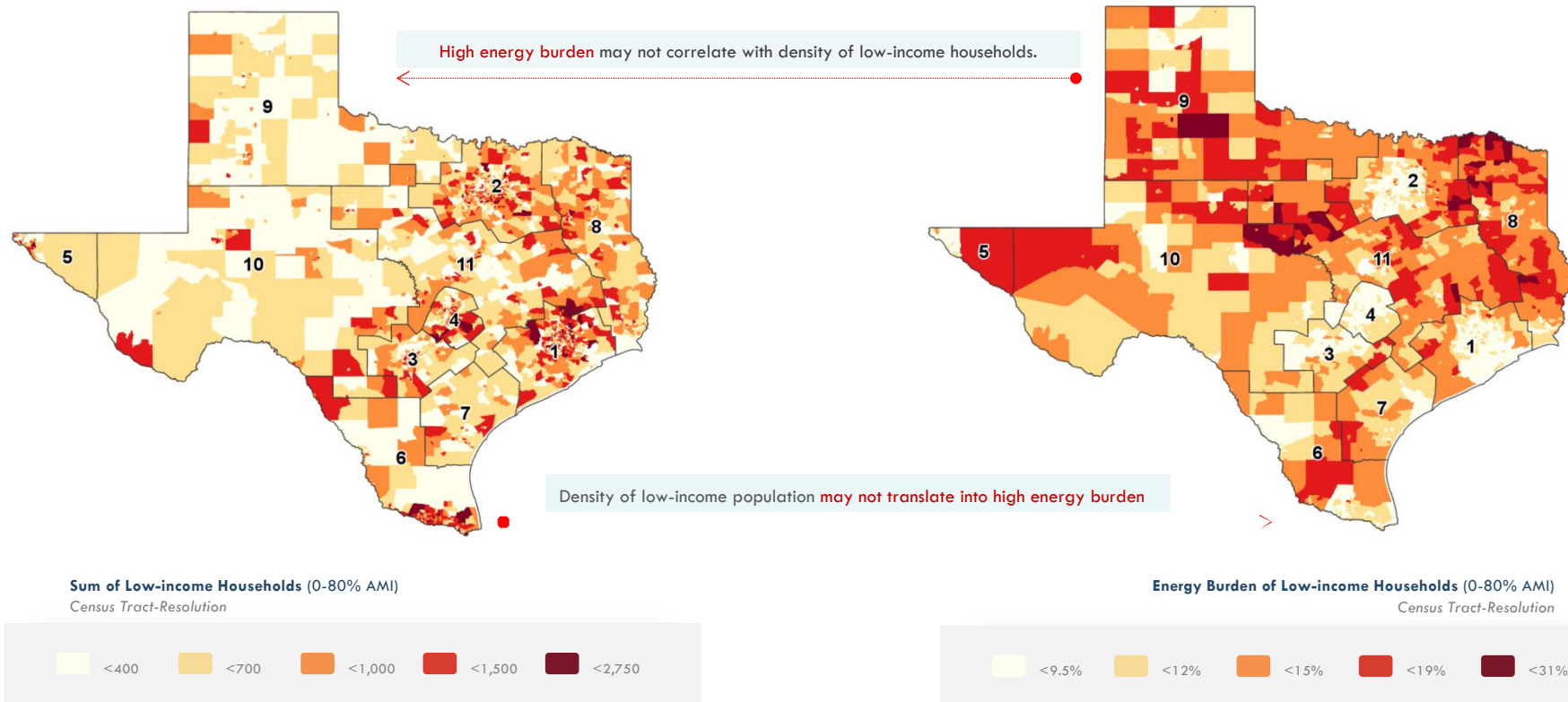
For all low-income households in Texas, the average energy burden is 10%

3%**Statewide Average**

For all households in Texas, the average energy burden is 3%

Density of Low-income Households Compared to High Energy Burden Average

Mapped by TEPRI (2019) | Data Source:
U.S. Department of Energy, 2018,
Low-Income Energy Affordability Data (LEAD),
with population data from 2015 5-Year
American Community Survey (U.S. Census)



DRIVERS OF HIGH ENERGY BURDENS

DRIVERS	EXAMPLES OF FACTORS THAT INCREASE ENERGY BURDEN
Physical	Housing age and type (e.g., manufactured homes)
	Heating system, fuel type, and fuel cost
	Poor insulation, leaky roofs, inefficient and/or poorly maintained HVAC systems, and/or inadequate air sealing
	Inefficient large-scale appliances (e.g., refrigerators, dishwashers) and lighting sources
	Weather extremes that raise the need for heating and cooling
Economic	Chronic economic hardship due to persistent low income
	Sudden economic hardship (e.g., severe illness, unemployment, or disaster event)
	Inability to afford (or difficulty affording) up-front costs of energy efficiency investments
	Difficulty qualifying for credit or financing options to make efficiency investments
Behavioral	Lack of access to information about bill assistance or energy efficiency program options
	Lack of knowledge about energy conservation measures and impacts/cost savings
	Increased energy use due to age, number of people in the household, or disability
Policy	Insufficient or inaccessible policies and programs for bill assistance, weatherization, and energy efficiency for low-income households
	Certain utility rate design practices, such as high customer fixed charges, that limit customers' ability to respond to high bills through energy efficiency or conservation

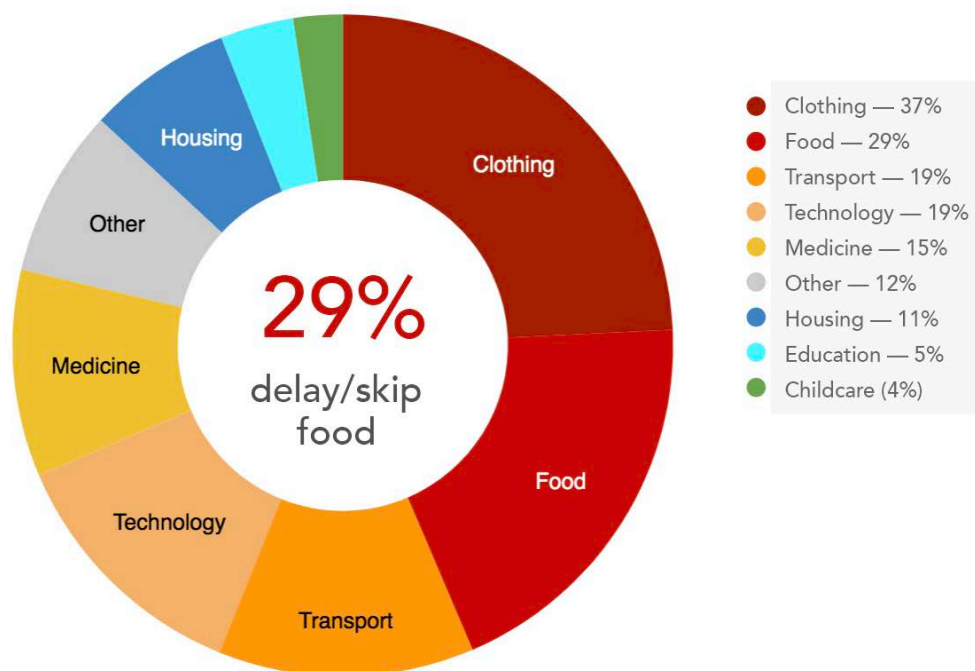
Source: American Council For An Energy Efficiency Economy

“

“[We trade off by] buying less food, we have been known to open the windows and go without AC in the summer and just turn on fans, and it does get hot sometimes. And then just cutting corners elsewhere, not going out to movies and doing things with the kids.”

Survey Participant in Waco, Texas

Trade-offs



36% of the **18-24** year old segment identified that they delay or skip **food** because of their utility bills.

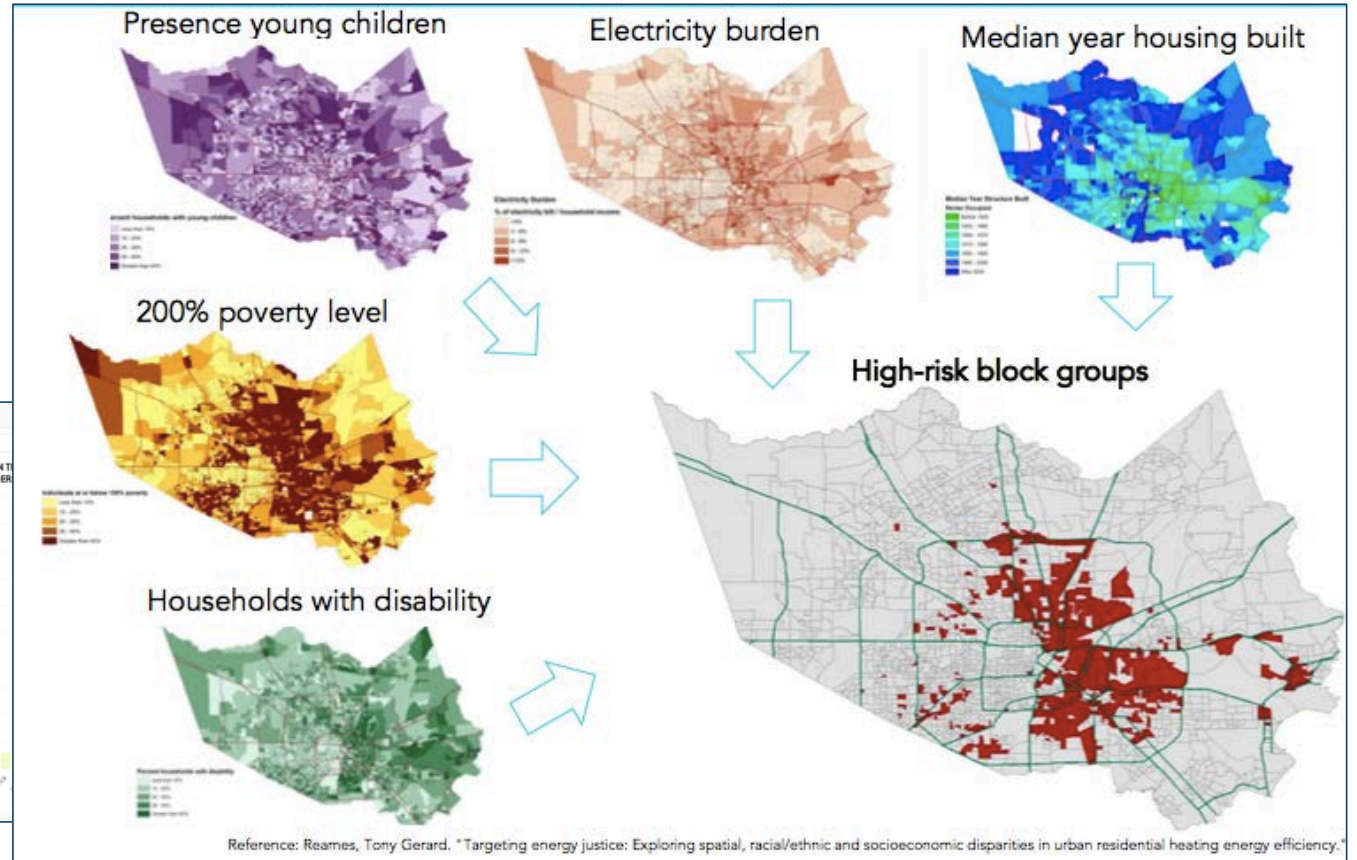
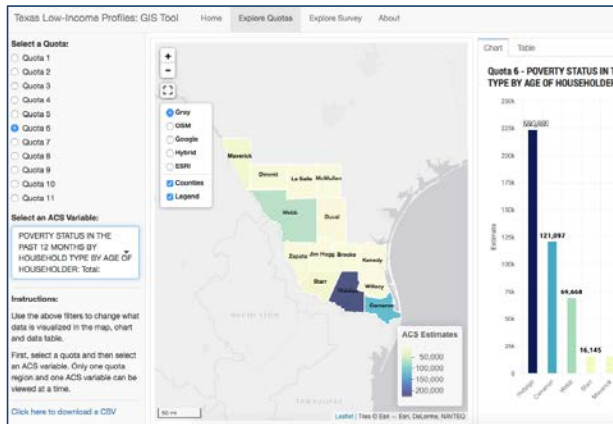



Survey Question

Do your utility bills cause you to delay or skip necessary spending or payments in any of the following categories? Please select all of that apply.

Community Needs Assessments

Example output and
interface of Energy
Poverty Risk
Mapping Tool



A wide-angle photograph of a solar farm. In the foreground and middle ground, multiple rows of solar panels are visible, tilted at an angle towards the sky. The panels are dark blue with silver frames, mounted on white metal supports. The ground is dry and grassy. The background is a vast, clear blue sky filled with soft, white, wispy clouds. A white rectangular box is overlaid on the right side of the image, containing text.

How can renewable energy contribute to equitable, sustainable, and affordable energy for all low-income households?

Principles of Equitable Program Design



Adapted from: <https://www.ucsusa.org/sites/default/files/attach/2019/05/equitable-policy-storage-principles.pdf>

Types of Renewable Energy Generation

Utility-Scale

Hydro, Biomass, Wind, Solar, Geothermal



Opportunity for system-wide savings, more certain electricity rates, and social benefits to the environment.

Customer-Sited

Solar, Geothermal heat pumps, Biomass



Ownership involves high upfront costs. Ways around these high costs include: grant funding, low-income utility rebates, and leasing models.

Community

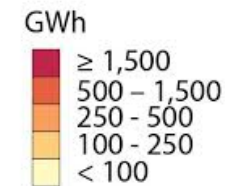
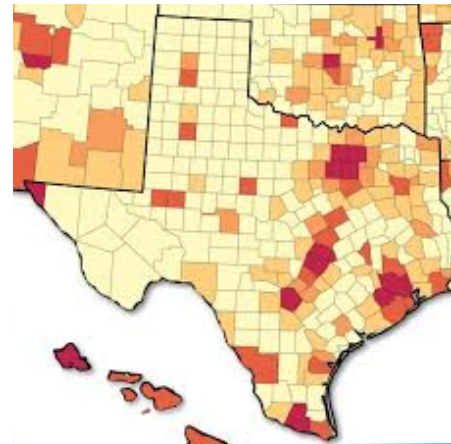
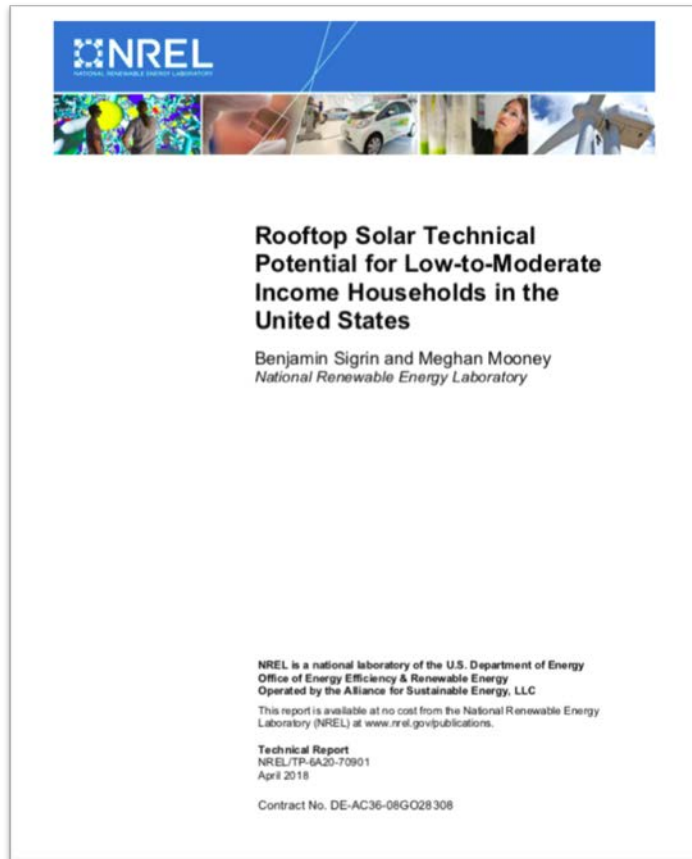
Solar, Wind (rare)



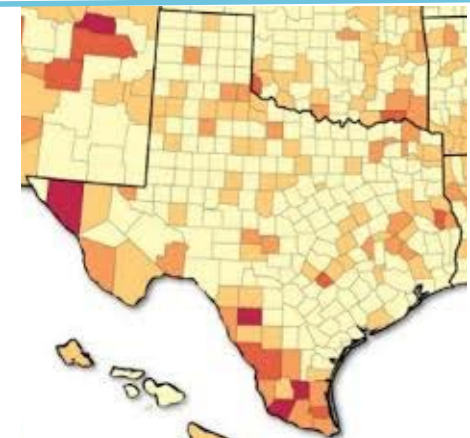
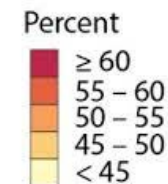
Community projects are sited to achieve optimal productivity. Participation is modeled as ownership, lease, or subscription.

Rooftop Solar Potential of LMI Housing

Absolute residential solar potential by county




County LMI rooftop technical potential as percent of total residential potential



Barriers to Access

To ensure that the benefits of renewable energy solutions flow to low-income communities, program design and marketing must remove common barriers.

- Older housing that may not be suitable
- Higher percentage of renters
- Lack of housing stability / likely to move
- Lack of capital to afford upfront costs
- No or low credit ratings
- Uncertainty in life circumstances



This solar carport at the Indian Pueblo Cultural Center in Albuquerque, New Mexico, delivers 23 MWh/year to the local utility grid.

Source: U.S. Department of Energy

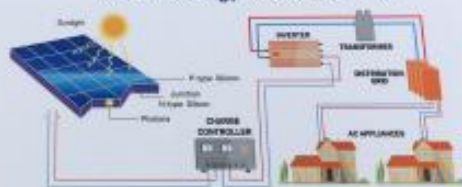
La Loma Community Solar →

Project information:

La Loma Community Solar Project installation began in 2017. The system capacity is 3.1 MW dc (2.6 MW ac). The installation consists of 9,054 Jinko modules (345 watt) and 43 Sungrow 60 kW ac inverters. The installation is expected to generate over 4500 MWh each year.



How Solar Energy Powers Your Home



For more information, visit
austinenenergy.com/go/communitysolar



La Loma Community Solar

Austin Energy reserved half of its 2.6 MW La Loma Community Solar project for customers who are eligible for its Customer Assistance Programs (CAP).

Subscription Model

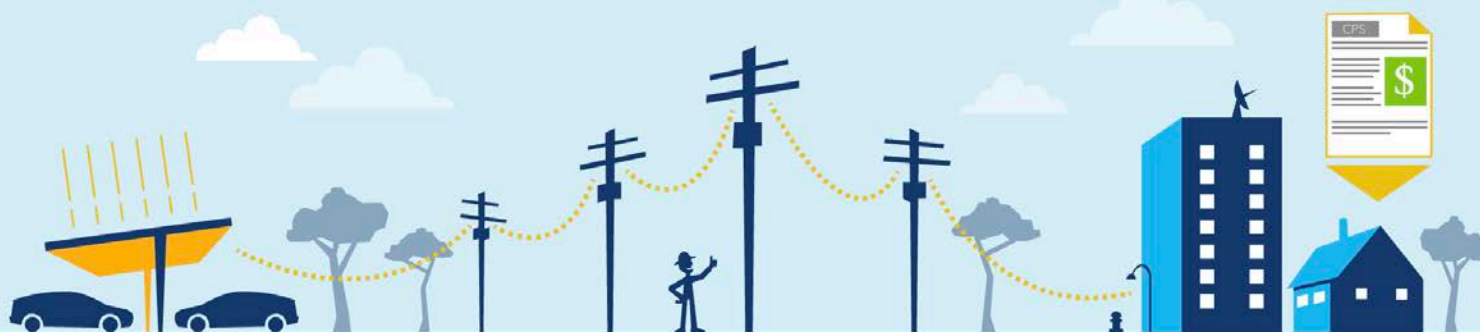
Renters and others can access local solar without installing on their own roof

No upfront costs, no maintenance responsibilities

If the customer moves and stays with the same utility, they maintain participation

Savings from day one, participants who are CAP-eligible receive a 1.5¢/kWh discounted rate

Here's how it works:



1

Energy is captured in sunny locations

Big Sun solar panels are installed on carports in reliably sunny locations. We install, maintain and monitor those panels, so you never have to worry.

2

We manage the energy for you

Energy generated from your Big Sun solar panels goes into the power grid. We monitor the amount of energy your panels produce.

3

Issue credit directly to your bill

Your credit lowers your monthly bill automatically and you can easily see how much energy your panels produced.

NOT
Interested

Just not interested

may sell home in 1-2 years.

TO old

We are on a ~~fixed~~ fix income

Live in apartment

Own Mobile home

only For Homeowners, but not For Renters

YES
Interested

yes any saving will help my family.

Briefly explain why or why not:

IF I am rewarded financially for participating, I would be interested.

because it saves money.

credits help with taxes

Briefly explain why or why not? Tax credit makes the ownership of solar more appealing because of the 30% deduction but it all depends on the total cost of it.

Emergency Assistance

Only 5% of Texas households who are eligible for LIHEAP received it in 2017¹

LIHEAP funding was down 32% from 2010-17¹
Funding is up 9% for 2019 compared to 2017²

U.S. electricity prices have increased ~15% in the past ten years,³ while wage growth has been low or flat⁴

Expensive alternatives, such as high-interest short-term loans or using a credit card, compound financial strain



Long-term Solutions

Low-income solar programs tend to guarantee day one savings that will persist or grow over time

Income disparity in solar adoption is receiving widespread attention and converting into action

The declining cost of solar is creating new opportunities to offer affordable options to low-income customers

Renewables have the potential to improve quality of life, reduce stress, and improve air quality

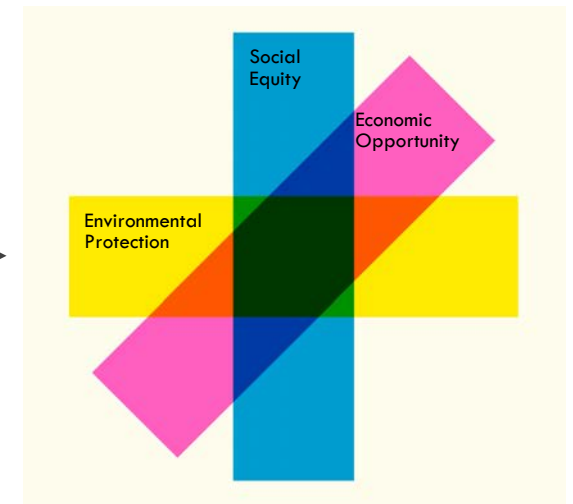
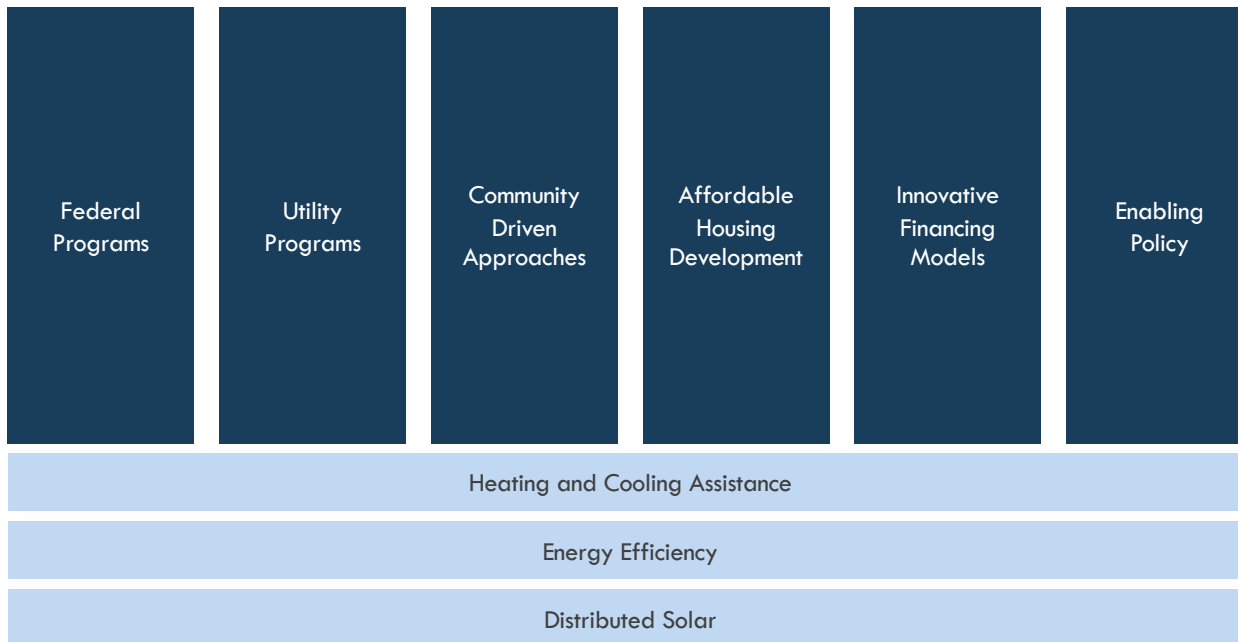
¹ NEUAC, *Texas Fact Sheet* (2017)

² U.S. HHS, *Administration for Children & Families* (2019)

³ EIA, *Average Retail Price of Electricity, Residential* (2008-2018)

⁴ Economic Policy Institute, *Nominal Wage Tracker* (2019)

High Leverage Strategy



CleanEnergy States Alliance

DECEMBER 2018



A Directory of State Clean Energy
Programs and Policies for
Low- and Moderate-Income
Residents

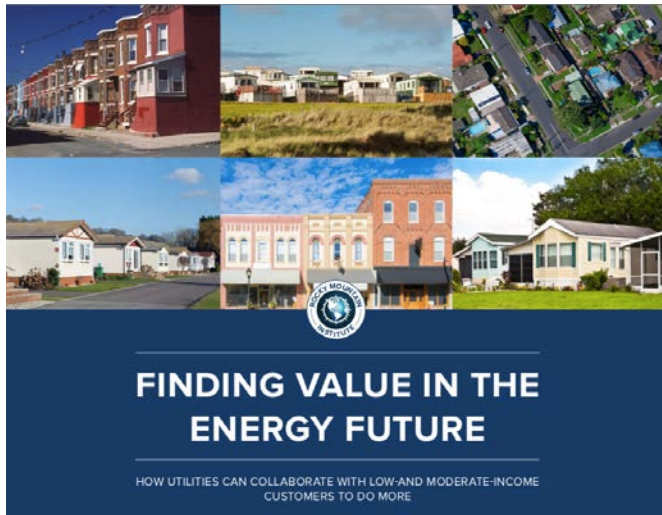


State	Program Name	Technology	System-level Incentives	Program-level Grants	Finance Assistance	Shared Solar	Mandate	Workforce Training	High-level and conceptual
District of Columbia	Solar for All	Solar PV		✓					
Hawaii	Green Energy Market Securitization (GEMS) On-Bill Repayment Program	Solar PV			✓				
Illinois	Solar For All	Solar PV	✓			✓	✓	✓	
Maryland	Community Solar Pilot Program	Solar PV				✓	✓		
Maryland	Community Solar LMI-PPA Grant Program	Solar PV		✓		✓			
Massachusetts	Commonwealth Solar	Solar PV	✓						
Massachusetts	SREC II	Solar PV	✓						
Massachusetts	SMART Program	Solar PV	✓						
Massachusetts	Mass Solar Loan	Solar PV			✓				
Massachusetts	Affordable Access to Clean and Efficient Energy Initiative	Unspecified							✓
Minnesota	Xcel Energy's Solar* Rewards Program	Solar PV	✓						

Source: [Clean Energy States Alliance: Directory of State Clean Energy Policies and Programs for Low-and Moderate-Income Residents, December 2018](#)

UTILITY LMI PROGRAMS

Several established models have expanded the values available from utility LMI programs



	OWNERSHIP	FINANCING	CONTROL	SERVICE DELIVERY
Model 1: Utility on-bill financing for energy efficiency upgrades	Customers have full ownership of energy efficiency upgrades.	Utility provides up-front capital for measures, and on-bill loans for customers.	Energy efficiency assets are controlled by the customer, and not aggregated.	The utility or a third party acquires customers, and the utility provides billing.
Model 2: Utility-owned PV systems that are accessed through lease or subscription	Utility owns photovoltaic (PV) assets.	The utility or a third-party financier provides project finance, and potentially a loan loss reserve for customers.	The utility controls its own PV assets, which can be aggregated in a rooftop model.	The third party contracted to the utility installs systems, and utility provides billing.
Model 3: Utility-administered philanthropic or government funding for customer-owned systems	Customers have full ownership of PV systems.	Philanthropic or government grant funding is used as project finance.	Customers control systems, and are not aggregated.	Third-party installers are contracted through the utility, and customers receive net metering credits on their utility bill.
Model 4: Utility provides controllable load devices for low-income customers	Customers or the utility may own the assets.	The utility provides upfront capital for controllable assets.	The utility controls assets to provide grid services.	Third-party installers are contracted to install devices, and customers receive credits for participation on their utility bill.

Source: [Rocky Mountain Institute: Finding Value in the Energy Future – How Utilities can Collaborate with Low-And Moderate-Income Customers To Do More, 2018](#)



Thank you.

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txenergypoverty.org

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