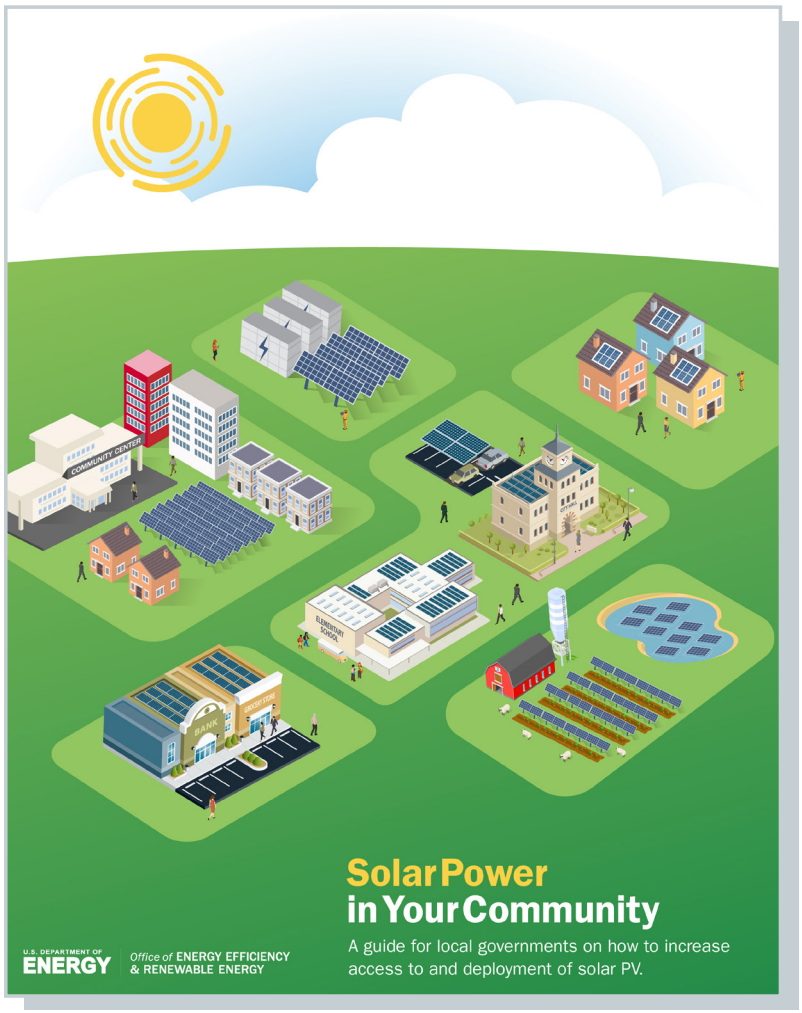
U.S. DEPARTMENT OF
ENERGY

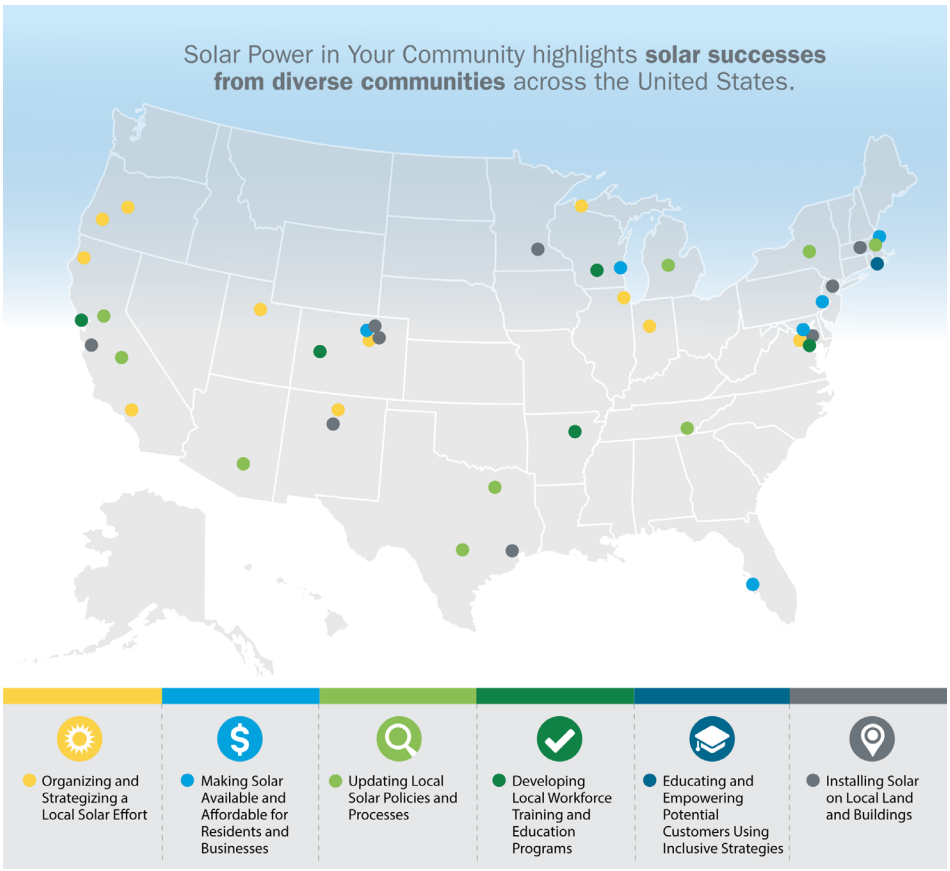
Office of
ENERGY EFFICIENCY &
RENEWABLE ENERGY

An Introduction to Solar Power in Your Community

The guidebook, produced by the U.S. Department of Energy Solar Energy Technologies Office and the National Renewable Energy Lab, highlights new technologies and strategies for maximizing the benefits of solar for all communities and emphasizes strategies for improving the equity of solar deployment at the local level.

The full-length version offers an in-depth introduction of each topic, case studies of real-world applications, and supplemental resources, including reports, references, tools, and a state and federal policy guide.





The Role of Local Governments in Accelerating Solar

Solar deployment has increased rapidly in the last 10 years, allowing more communities to access the benefits of solar photovoltaics (PV). This increase has also allowed solar to play an important role in local plans such as resilience planning, sustainability planning, and climate action planning.

Despite substantial market growth and the incorporation of solar into local planning, barriers to PV adoption continue to pose challenges for local governments and other community stakeholders. Barriers and challenges include access to capital, limited land or rooftop availability, complex local policies, lack of a skilled local workforce, and more. Many barriers disproportionally impact low- to moderate-income (LMI) households and under-resourced communities (Heeter et al. 2021).

Local governments are uniquely positioned to remove many of the barriers to widespread solar adoption. They can organize and strategize local solar efforts, take steps to make solar available and affordable for residents and businesses, update solar process and policies, develop local workforce training and education programs, educate and empower potential customers using inclusive strategies, and install solar on local land and buildings.

Organizing and Strategizing a Local Solar Effort

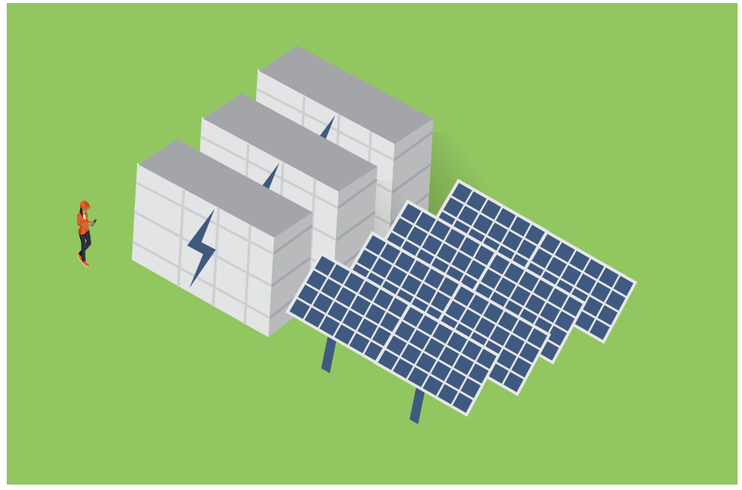
Taking the time to organize and develop a strategic approach will help community leaders work with their communities to make the best choices for solar development. An advisory group and other forms of stakeholder engagement should help local governments gain the perspectives of and obtain buy-in from local solar energy market participants. Local governments can gather input to understand local priorities, inform solar target setting, identify contextual issues such as local land use and historical inequities, and educate the public about solar. Including key community members and organizations on solar advisory committees and task forces can increase the effectiveness, equity, and inclusiveness of the local solar effort.

Solar Spotlight: Ensuring LMI Inclusion in Solar Efforts

LMI households represent 43% of all U.S. households and account for 42% of residential rooftop potential (Sigrin and Mooney 2018). However, as of 2018, LMI households only represented 15% of residential solar adopters (Barbose et al. 2020). At the same time, LMI communities typically have substantially larger energy burdens than their high-income counterparts, meaning a larger proportion of their income goes toward their energy bill (Drehobl et al. 2020).

Solar energy technologies can be used in combination with energy efficiency and other programs to reduce the energy burden of low-income customers. Solar can also offer additional benefits, such as reduced need for bill assistance, reduced utility shutoffs, and local job opportunities. Numerus states have implemented programs and policies to address the disparity in solar adoption to date, and local governments have the opportunity to implement their own programs on the local level.

Setting solar installation targets is the next important step in strategizing a local solar effort, as it helps clarify the role solar energy will play in achieving a community's broader environmental, climate change, sustainability, or energy resilience goals. Setting targets helps create momentum for a solar program, with stakeholders working toward common goals. Energy-sector resilience may also be included in local planning, and solar energy can play a role in resilience in conjunction with energy storage, energy efficiency, microgrids, and smart grids.



Making Solar Available and Affordable for Residents and Businesses

After setting solar targets, local decision makers need to identify ways to reach those targets. Local governments may consider solar products such as on-site solar, off-site solar, or purchasing mechanisms such as virtual power purchase agreements (PPAs), community choice aggregation (CCA), renewable energy certificates (RECs), or third-party ownership models.

Many cities and counties have also implemented incentives and financing programs for residents and local businesses to help make solar affordable. Solarize campaigns, for example, reduce the upfront cost of solar by giving groups of individuals or businesses a discounted rate for bulk purchases. Localities may also consider offering a property assessed clean energy (PACE) financing program or utilizing a Green Bank to help secure low-cost capital for clean energy projects at favorable rates and terms. There are additional mechanisms that can be implemented to help overcome solar adoption barriers specific to LMI households.

Updating Local Policies and Processes

The local legal and regulatory framework forms the foundation for building a sustainable solar market. Effective and streamlined local rules and regulations help reduce installation costs and can significantly increase adoption rates for solar energy.

By incorporating solar energy considerations into codes and ordinances, local governments can increase solar accessibility and deployment. Streamlining PV permitting and inspections can allow more residents and businesses to install and operate the solar panels at a faster pace. Clarity and transparency throughout these processes help ensure that solar can expand into underserved areas and help reduce social disparities in solar adoption.

Developing Local Workforce Training and Education Programs

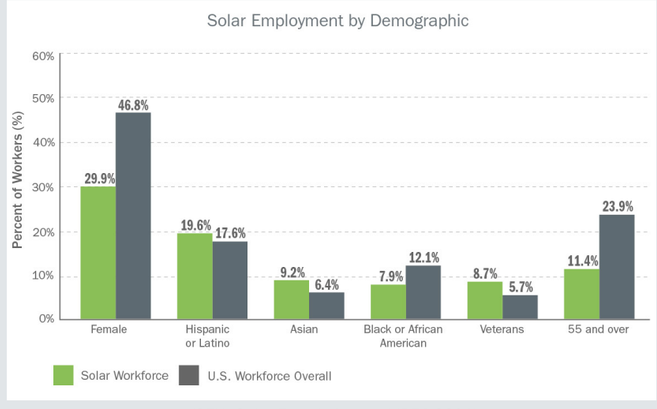
A robust solar workforce education and training program is a critical pillar of developing a local solar energy industry. For solar installers, training programs help ensure consistent installer competency and, through increased consumer satisfaction, can help drive additional local demand for solar installations. Thoughtful workforce recruitment and development can also help ensure that the industry reflects local diversity, that opportunities are widely accessible, and that economic growth reaches areas where it provides the greatest benefit.

Many U.S. K-12 schools are integrating solar and energy systems into their science, technology, engineering, and mathematics curricula. By going solar, schools can use project-based data for energy-themed lessons and professional development. In addition, solar on schools can reduce energy costs and contribute to local resilience by turning the school into a local resource for safety during disasters. Solar training programs run by community colleges are also well suited to help build local solar workforces.

Solar Spotlight: Racial Equity in Solar Adoption

Although U.S. solar deployment has grown steadily over the past decade, deployment has not been equitable for all Americans. Recent analysis shows that rooftop PV adoption rates are significantly lower in Black- and Hispanic-majority census tracts, even when controlling for differences in household income and home ownership (Sunter et al. 2019). The solar workforce is another area with underrepresentation of certain groups, as reported by the 2020 National Solar Jobs Census (SEIA, Solar Foundation, and IREC 2021).

Local governments are in the unique position to help change this by striving for greater equity in access to solar benefits. Some ways that local jurisdictions can help create a more equitable local solar market include adopting racial equity goals, accounting for historical injustices, ensuring diversity and representation on local advisory committees, working with local minority-owned businesses, and including underrepresented minorities in decision-making about solar.



(SEIA, Solar Foundation, and IREC 2021)

Educating and Empowering Potential Customers Using Inclusive Strategies

Local governments can engage their communities using a variety of outreach activities that promote solar energy technologies. These activities can supplement the public's knowledge about solar energy, promote consumer confidence, and help consumers decide whether to install solar energy systems on their properties. Different groups of people have different priorities related to adopting solar, so targeted and inclusive educational materials are important for achieving broad acceptance. For these resources to be inclusive, they should be accessible in different languages, sensitive to differences in motivation for solar adoption, and tailored to the needs of vulnerable subsets of the community.

Installing Solar on Local Land and Buildings

Government buildings can offer structures for PV, directly benefitting the community by adding renewable energy to publicly available communal spaces, reducing government energy costs, and providing educational opportunities. Local governments often own land and facilities near electricity load centers, making them good hosts for renewable energy generation. Leading by example can encourage area residents and businesses to adopt solar and can also provide an educational opportunity for the surrounding community.

For local government-owned land, community solar may be an ideal option. Community solar is a distributed solar energy deployment model that allows customers to buy or lease part of a larger, off-site shared PV system. Community solar projects can be sited in a variety of spaces, including LMI neighborhoods, public lands, or on a former industrial or commercial site that may be contaminated known as, a brownfield.

Local governments may consider more innovative approaches and install technologies such as electric vehicle charging infrastructure paired with solar, or consider innovative site types, like agrivoltaics and floating PV. ■

More Information

Download the full report at: www.energy.gov/solarguidebook

Contact the lead author: Emily Fekete, emily.fekete@nrel.gov.

Sources:

Barbose, Galen L., Sydney Forrester, Naïm R. Darghouth, and Ben Hoen. 2020. *Income Trends Among U.S. Residential Rooftop Solar Adopters*. Berkeley, CA: Lawrence Berkeley National Laboratory. https://doi.org/10.2172/1603637.

Drehobl, Ariel, Lauren Ross, and Roxana Ayala. 2020. How High Are Household Energy Burdens? *An Assessment of National and Metropolitan Energy Burdens Across the U.S.* Washington, D.C.: American Council for an Energy-Efficient Economy. https://www.aceee.org/research-report/u2006.

Heeter, Jenny, Ashok Sekar, Emily Fekete, Monisha Shah, and Jeffrey J. Cook. 2021. *Affordable and Accessible Solar for All: Barriers, Solutions, and On-Site Adoption Potential*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-80532. https://www.nrel.gov/docs/fy21osti/80532.pdf.

SEIA, Solar Foundation, and IREC. 2021. *National Solar Jobs Census 2020*. Solar Energy Industries Association, Solar Foundation, and Interstate Renewable Energy Council. https://www.seia.org/sites/default/files/2021-05/National-Solar-Jobs-Census-2020-FINAL.pdf.

Sigrin, Benjamin O., and Meghan E. Mooney. 2018. *Rooftop Solar Technical Potential for Low-to-Moderate Income Households in the United States*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-70901. https://doi.org/10.2172/1434891.

Sunter, Deborah A., Sergio Castellanos, and Daniel M. Kammen. 2019. "Disparities in Rooftop Photovoltaics Deployment in the United States by Race and Ethnicity." *Nature Sustainability* 2: 71–76. https://doi.org/10.1038/s41893-018-0204-z.

U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

For more information, visit:
energy.gov/solarguidebook

DOE/GO-102022-5692 • January 2022