Financing Opportunities for State and Local Governments To Improve Efficiency Across the Residential Sector

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Disclaimer

Introduction

The transition to low-carbon housing can be accelerated through access to low-cost financing that enables homeowners to cost-effectively adopt energy efficiency and renewable energy. This overview document is for public-sector decision makers, particularly state and local governments with goals to improve residential efficiency and reduce greenhouse gas emissions. This document is intended to help state and local decision makers understand which financing mechanisms are best-positioned to serve different residential market segments. Leveraging financing supports the necessary upgrades that will transition residential homes to low-carbon emissions, save families money, drive improvements in health outcomes, update aging infrastructure, and spur investment in workforce and economic development.

Everyday homeowners are making decisions about replacing equipment that can last 15-plus years. Access to financing can ensure homeowners overcome the upfront cost barrier of energy-efficient equipment and avoid “locking in” higher carbon emissions when cleaner options are now readily available. Federal funding from the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA) presents an opportunity for states to expand access to low-cost financing for residential energy retrofits.

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List of Acronyms

CDFI	Community Development Financial Institutions
C-PACE	Commercial Property Assessed Clean Energy
BIL	Bipartisan Infrastructure Law
DOE	U.S. Department of Energy
EEM	Energy-Efficient Mortgage
ESPC	Energy Savings Performance Contract
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
IRA	Inflation Reduction Act
LEAD	Low-Income Energy Affordability Data
NASEO	National Association of State Energy Officials
NYSERDA	New York State Energy Research and Development Authority
R-PACE	Residential Property Assessed Clean Energy
SCEP	Office of State and Community Energy Programs

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Residential Housing Market

In the United States, residential buildings account for 20% of total energy consumption (EIA 2024a), with household energy costs averaging $1,884 per year ($2,156/year for single-family homes and $1,193 for multifamily units) (EIA 2024b). In 2019, the average household released an estimated 17,320 lbs. of carbon emissions. This equates to the average household releasing 70% more carbon emissions than the average passenger vehicle (BTO n.d.). Prioritizing energy efficiency and reducing carbon emissions across the residential sector can have a significant impact on lowering a community's carbon footprint and advancing energy goals.

Within the residential housing market, there are two primary sectors: single-family homes and multifamily properties.[1] As of 2020, there were 123 million housing units across the United States, including 85 million single-family homes (70%), 32 million multifamily properties (25%), and 7 million manufactured housing units (5%) (EIA 2020).

The multifamily sector further divides into market-rate and affordable housing. For market-rate housing, a unit's rent reflects the prevailing market value for the area, and affordability is generally based on an individual's income level. Housing is considered affordable when the rent or mortgage, plus utilities, is no more than 30% of a household's gross income (Arlington County Virginia n.d.). Within affordable housing, there are subsidized and naturally occurring affordable housing rental properties, the latter being existing multifamily rental properties that are affordable without public subsidy to low-income households (Kling et al. 2021). Subsidized units are guaranteed through the federal, state, or county government or other tax-exempt financing mechanisms to remain affordable. Naturally occurring affordable housing units are owned by the private sector, and their affordability fluctuates based on the area's employment trends, housing conditions, and economic stability.

Single-family and multifamily houses each present their own set of opportunities and challenges when it comes to accessing financing and implementing energy efficiency projects. Saving energy may not be a single-family homeowner's highest priority when deciding to make upgrades. Realizing energy savings can be further complicated by not knowing where to start and or how to navigate competing guidance from contractors and the wide range of available products.

In multifamily housing, studies estimate that energy efficiency could cut the multifamily affordable housing sector's electricity usage by as much as 26% (Mosenthal and Socks 2015). The cost savings realized from reduced energy use resulting from energy efficiency upgrades can also help preserve affordability. The multifamily sector has been historically underserved by energy efficiency programs due to challenges around split incentives (owners are responsible for capital improvements, but tenants pay the energy bill), access to capital, occupancy duration, and debt limits.

[1] The U.S. Census Bureau considers single-family homes to be freestanding buildings of one to four units with no shared spaces or common walls and doors and multifamily housing to be structures with five or more dwelling units.

Roles for State and Local Governments

There are several ways that state and local governments can support energy efficiency and carbon-reduction project financing, such as, for example, supporting legislation that creates or improves financing products, contributing to key program design decisions—through stakeholder engagement strategies, convenings, and other methods—and leading educational campaigns to provide homeowners and residents with trusted information about available opportunities. Forming strong partnerships with community stakeholders is another way to advance residential energy efficiency. To support financing opportunities for residents, local and state governments can consider partnering with local banks, private lenders, developers, and housing authorities that can support programs serving residents from all income levels and housing types (e.g., program marketing, education, and services such as underwriting). Depending on regional circumstances, local governments can also work with utilities to design efficiency programs and incentives to benefit disadvantaged communities.

Stakeholders and Potential Collaborators

- Local housing authority
- Local community development corporation
- State housing finance authority
- State energy offices
- Local energy and sustainability offices
- Local utilities
- Lenders/banks
- State or local green bank
- Real estate community

State and local governments can consider the following list of activities:

- Design financing solutions that work with federal or other state programs (e.g., with rebate programs that limit pairing federal funds with grants; additional capital could be structured as loans), even if forgivable over time.
- Ensure consumer protection laws are robust when it comes to financing energy improvements, particularly those lending products marketed at point of sale.
- Convene stakeholders to inform and support solutions; include philanthropic organizations, nonprofits, financial institutions, etc.
- Provide tax credits and deductions for energy efficiency upgrades.
- Issue green bonds to help subsidize grants, programs, and financing programs.
- Require energy performance disclosure at time of home sale, because this is a natural time to raise awareness with buyers about energy upgrades and the opportunity to finance them with a mortgage.
- Work with state housing finance agencies to ensure they can offer energy-efficient mortgages (EEMs), if not already, or collaborate on resolving challenges with EEMs.

- Develop robust tracking and monitoring requirements for state- and local-supported financing programs to measure program impacts on priority population segments.

The following section goes into more detail on traditional financing products commonly used to pay for energy efficiency, as well as "specialized" products designed to overcome market barriers and support the implementation of energy efficiency and clean energy projects. Additionally, the Better Buildings Financing Navigator is a great starting point when gathering information on different types of financing solutions for energy efficiency and renewable energy projects. Through the Financing Navigator, users can learn the basics of the financing market, explore fact sheets and industry resources, and compare financing options.

Multifamily and Public Housing Finance Opportunities

Energy Savings Performance Contracts (ESPCs)

ESPCs Overview[2]	
Financing Option Overview	Performance contracts, or ESPCs, stipulate that an energy service company will coordinate installation and maintenance of efficiency improvements in a customer's facilities. Payment will come from the resulting energy savings, guaranteeing performance of all equipment throughout the payback period.[3]
Residential Sector Target Market	Multifamily building owners (most common in public housing projects).
Key Stakeholders	Energy service companies, building owners, lenders/investors.
Financing Use Case	Good fit for large projects ($500,000+, preferably $5 million+), long-term financing (typically 10–20 years), having a third party take on the performance risk and provide a savings guarantee.
State and Local Government Action	Pass enabling legislation; develop ESPC programs that provide technical assistance (e.g., assist with audits, prequalify energy service companies); facilitate procurement; and provide long-term project results tracking.

[2] For more information, see https://betterbuildingssolutioncenter.energy.gov/financing-navigator/option/espc-financing.
[3] There are other performance-based products such as energy services agreements, which have been used to finance multifamily building retrofits (e.g., New York City, New York [https://nyceec.com/products/#ESALoan]). ESPCs always include a performance guarantee, while energy services agreements may not always include a performance guarantee.

Key Resources	U.S. Department of Energy's (DOE's) Energy Savings Performance Contracting (ESPC) Toolkit (https://betterbuildingssolutioncenter.energy.gov/energy-savings-performance-contracting-espc-toolkit). U.S. Department of Housing and Urban Development (HUD) Notices and Procedures (https://www.hud.gov/program_offices/public_indian_housing/programs/ph/pheb/eperformance): HUD has ESPC requirements in which housing authorities are required to get approval prior to entering a performance contract.

- **Examples:** The ESPC examples highlighted reflect a mix of financing options across various stakeholder groups (traditional banks, state and local governments, private-sector third parties, and quasi-public entities).
  - Denver Housing Authority's Self-Managed Energy Performance Contracting (https://betterbuildingssolutioncenter.energy.gov/implementation-models/dhas-self-managed-energy-performance-contracting): The Denver Housing Authority completed a traditional ESPC that has served as a vehicle for major capital improvements, facility upgrades, and in-unit energy upgrades, resulting in $2.6 million in utility savings annually.
  - Jersey City Housing Authority Leverages Energy Performance Contract for Energy Efficiency Projects (https://betterbuildingssolutioncenter.energy.gov/implementation-models/jersey-city-housing-authority-leverages-energy-performance-contracts-energy): The Jersey City Housing Authority used ESPC funding to upgrade energy and water equipment, resulting in $5 million savings within the first 2 years and increased comfort for over 1,700 residents.
  - Rockford Housing Authority's Use of Energy Performance Contracting for Quality Affordable Housing (https://betterbuildingssolutioncenter.energy.gov/implementation-models/rockford-housing-authoritys-use-energy-performance-contracting-quality): The Rockford Housing Authority engaged in a $7.5 million ESPC to conduct a comprehensive energy audit and implement energy efficiency measures at eight of its multifamily properties, reducing energy costs by over $100,000 a year while improving the quality of housing for low-income housing tenants.

Commercial Property Assessed Clean Energy (C-PACE) for Multifamily

C-PACE for Multifamily Overview[4]	
Financing Option Overview	Multifamily building owners finance qualifying improvements through a voluntary assessment placed on their property tax bill.

[4] See https://unety.io/assets/publications/commercial-pace-for-housing.pdf for more information.

Residential Sector Target Market	Multifamily building owner.
Key Stakeholders	C-PACE administrators, local governments, building owners, lenders/investors.
Financing Use Case	Provides long-term financing (10+ years) with lower monthly payments and is even beneficial to a building owner with short-term ownership plans because the financing obligation is transferred to the new owner at the time of sale.
State and Local Government Action	States can support enabling legislation and active programs. Most C-PACE programs are currently privately financed.
Key Resources	DOE's C-PACE Toolkit (https://www.energy.gov/scep/slsc/commercial-property-assessed-clean-energy-pace-toolkit).

- **C-PACE examples:** The C-PACE examples highlighted reflect a mix of financing options across various stakeholder groups (traditional banks, state and local governments, private-sector third parties, and quasi-public entities).
  - City of Milwaukee: Property Assessed Clean Energy Program to Finance Efficiency Improvements (https://betterbuildingssolutioncenter.energy.gov/implementation-models/city-milwaukee-property-assessed-clean-energy-program-finance-efficiency): Milwaukee, Wisconsin, created a C-PACE program that allows building owners, including multifamily property owners, to pay for energy projects through a voluntary municipal special charge that is attached to the property, not the owner. To date, the city has yielded annual savings of over $1 million.
  - Greenworks Lending Funds Efficiency, Renewable, and Microgrid Improvements Using C-PACE (https://betterbuildingssolutioncenter.energy.gov/implementation-models/greenworks-lending-funds-efficiency-renewable-and-microgrid-improvements): Hartford, Connecticut, financed a $1 million project through Greenworks Lending's C-PACE structure to implement energy efficiency, renewable energy, and microgrid improvements for a mixed-use housing and retail building.
  - Washington, D.C.: Low-Income Multifamily Retrofit Financed with C-PACE (https://dcgreenbank.com/wp-content/uploads/2022/03/Case-Study-Phyllis-Wheatly-YWCA.pdf): C-PACE was part of the $17 million in financing used to retrofit the Phyllis Wheatley YWCA, which includes 84 rental units for low-income and vulnerable women.

Leasing

Leasing Overview[5]	
Financing Option Overview	Financing structure that allows a customer to use energy efficiency, renewable energy, or other generation equipment without purchasing it outright. At the end of the lease, the customer may have the option to purchase the equipment, return it, or extend the contract.
Residential Sector Target Market	Multifamily building owner, single-family homeowner.
Key Stakeholders	Lessors (manufacturers, vendors, or installers of the energy equipment), building owners.
Financing Use Case	Desirable for multifamily property owners who are limited in the amount of debt that they can undertake. Compared to loans, there is usually a faster turnaround period, and lease financing can cover a wider array of project costs, including installation (hard and soft costs). Single-family homeowners can use a lease or a power purchase agreement to avoid upfront system costs and spread out their payments over time.
State and Local Government Action	Collaborate with private lenders to develop and administer programs that promote implementing energy efficiency projects through lease financing.
Key Resources	Learn more about lease financing opportunities in the Better Buildings Financing Navigator (https://betterbuildingssolutioncenter.energy.gov/financing-navigator/option/lease-financing). For homeowners considering solar in particular, see *A Homeowner's Guide to Solar Financing* from Clean Energy States Alliance (https://www.cesa.org/wp-content/uploads/Homeowners-Guide-to-Solar-Financing.pdf).

Example: PosiGen (https://www.posigen.com/): Offers leasing and lease-to-buy opportunities for solar and free energy audits (heating and cooling) for multifamily and single-family homes.

Predominantly Single-Family[6]

Unsecured Loans

Unsecured Loans Overview	
Financing Option Overview	Unsecured loans are not tied to any form of collateral. These types of loans are available through traditional banks, private lenders, and vendors of energy efficiency products.
Residential Sector Target Market	Single-family homeowners, multifamily residents, or property owners.

[5] See https://betterbuildingssolutioncenter.energy.gov/financing-navigator/option/lease-financing for more information.
[6] Some of the financing opportunities discussed in this section can also be applied to the multifamily sector.

Key Stakeholders	Lenders (traditional banks, private lenders, state and local governments, green banks, etc.), utilities, credit enhancement sponsors.
Financing Use Case	Good for single-measure upgrades such as replacing heating, ventilation, and air-conditioning (HVAC) equipment, for borrowers who might not have sufficient equity in their home, and during situations in which financing needs to be secured quickly.
State and Local Government Action	Establish and support green banks. Help utility companies and community development financial institutions (CDFIs) establish loan programs. Set up revolving loan funds and other credit enhancement vehicles, including leveraging public dollars to attract private capital. This can serve to increase program scale, lower rates, and enable longer terms. Ensure consumer protection laws are robust when it comes to financing energy improvements, particularly those lending products marketed at point of sale.
Key Resources	"Revolving Loan Funds," DOE (https://www.energy.gov/scep/slsc/revolving-loan-funds).

- **Unsecured loan examples**: The examples highlighted below reflect a mix of financing options across various stakeholder groups (traditional banks, state and local governments, private-sector third parties, and quasi-public entities). More expensive financing options offered by contractors/vendors are not included. The program examples listed are those developed and supported by state and local governments and utilities.
    - Mass Save HEAT Loan (https://www.masssave.com/residential/programs-and-services/financing): Offers interest-free financing opportunities up to $25,000 for energy-efficient home upgrades such as heating and water heating equipment, central A/C, heat pumps, insulation, and more.
    - Michigan Saves Home Energy Loan Program (https://michigansaves.org/homeowners/#how-it-works): Helps families and households reduce costs by financing air sealing, heating and cooling systems, insulation, and appliances. Homeowners can select from 150+ approved upgrades and work with an authorized contractor through an authorized lending partner.
    - New York State Energy Research and Development Authority's (NYSERDA's) Residential Financing Programs (https://www.nyserda.ny.gov/All-Programs/Residential-Financing-Programs): Multiple loan products designed to help lower-income New Yorkers and those who cannot qualify for traditional financing access lower-interest-rate financing for residential energy efficiency upgrades.
    - Sacramento Municipal Utility District Home Performance Program (https://www.smud.org/Rebates-and-Savings-Tips/Improve-Home-Efficiency): Through this program, home energy upgrade projects can be financed with a sustainable home improvement loan, offered through one of two private banks. Both secured and unsecured loans are available, with the maximum unsecured loan amount being $30,000. This loan can be applied toward

heating and cooling systems, heat pump water heaters, sealing and insulation, and making homes electric-ready.

- Smart E-Loan (https://www.ctgreenbank.com/home-solutions/smart-e-loans/): Connecticut Green Bank, in partnership with Energize Connecticut, offers residents the opportunity to upgrade their home's efficiency and energy performance with no money down and flexible terms, including unsecured personal loans, fixed monthly payments, and no pre-payment penalty.

Secured Loans

Secured Loans Overview	
Financing Option Overview	Secured loans are directly tied to real property, such as through a conventional mortgage. This security mitigates the lender's losses in case of a default. Examples of secured loans include EEMs—which allow eligible efficiency improvements to be added to the loan balance at time of purchase or refinance and amortized with the mortgage—and home equity loans and equity lines of credit.
Residential Sector Target Market	Single-family homeowners, multifamily property owners.
Key Stakeholders	Lenders (traditional banks, private lenders, local governments, etc.).
Financing Use Case	Because mortgages typically have the lowest interest rates for consumer financing, secured loans are a good option for major home renovation and improvement projects.
State and Local Government Action	Work with their state housing finance agency to ensure they can offer energy efficient mortgages, if not already, or collaborate on resolving challenges with EEMs. Require energy performance disclosure at time of sale, like in Portland, Oregon (City of Portland, Oregon n.d.), because this is a natural time for purchasers to identify upgrades and roll them into the mortgage; this helps increase awareness of the mortgage financing opportunity. Develop credit enhancement mechanisms to support CDFIs' ability to offer energy mortgages and home equity loans for improvements.
Key Resources	"Energy-Efficient Mortgages," DOE (https://www.energy.gov/energysaver/energy-efficient-mortgages).

- **Secured loan examples:** The secured loan examples highlighted reflect a mix of financing options across various stakeholder groups (traditional banks, state and local governments, private-sector third parties, and quasi-public entities).
  - Minnesota Housing Finance Authorities Fix-Up Program (https://www.mnhousing.gov/homeownership/improve-your-home.html): Statewide home improvement loan program offering secured and unsecured loan options for eligible homeowners through participating lenders. Available loans range from $25,000 to $75,000.
  - Federal and government-sponsored enterprise:

- Fannie Mae's HomeStyle Energy Mortgage (https://yourhome.fanniemae.com/buy/youve-got-options-when-it-comes-home-financing) and Freddie Mac's GreenCHOICE Mortgage (https://sf.freddiemac.com/working-with-us/origination-underwriting/mortgage-products/greenchoice-mortgages): Bundle eligible costs or the refinancing of prior energy-improvement debt so that homeowners can pay for their energy efficiency upgrades over the life of their mortgage.
- The Federal Housing Administration's Insured Energy Efficient Mortgage (https://www.hud.gov/program_offices/housing/sfh/eem/energy-r): Allows borrowers to add debt to their mortgage at the time of purchase or refinancing.
- U.S. Department of Agriculture Single Family Housing Repair Loans & Grants (https://www.rd.usda.gov/programs-services/single-family-housing-programs/single-family-housing-repair-loans-grants): Provide loans to low-income homeowners to repair, improve, or modernize their homes.
- Fannie Mae's Green Financing (https://multifamily.fanniemae.com/financing-options/specialty-financing/green-financing) and Freddie Mac's Green Advantage (https://mf.freddiemac.com/product/green-advantage) programs: Provide mortgage financing to apartment buildings and cooperatives to finance energy and water efficiency property improvements, including preferential pricing and additional loan proceeds for retrofits.
- HUD's Green and Energy Efficient Housing (https://www.hud.gov/program_offices/housing/mfh/green): By reducing mortgage insurance premiums, incentivizes multifamily property owners to adopt higher standards for construction, rehabilitation, repairs, maintenance, and property operations that are more energy-efficient and sustainable than traditional approaches to such activities.

On-Bill Financing and Tariffed On-Bill Repayment (also called "inclusive utility investment program")[7]

On-Bill Financing and Tariffed On-Bill Repayment Overview	
Financing Option Overview	A utility or private lender can supply capital to a customer to fund energy efficiency, renewable energy, or other generation projects, and is repaid through regular payments on an existing utility bill. This type of program offers low-to-zero interest rates, typically has a simple contract structure, and provides streamlined repayment. This type of program can also use alternative underwriting, which

[7] Can include tariffed on-bill financing (also called "inclusive utility investment"), in which the funds provided to the consumer are not technically a loan.

	expands access to low-credit or low-income customers. However, this type of program is only available in areas where utilities support on-bill programs.
Residential Sector Target Market	Single-family homeowners or multifamily bill payers.
Key Stakeholders	Utilities, private lenders.
Financing Use Case	Good for single-measure upgrades such as replacing HVAC equipment or whole-home retrofits that reduce energy bills.
State and Local Government Action	Develop policies and enabling legislation that support on-bill programs, including setting up revolving loan funds to capitalize on-bill programs. Municipal utilities could consider offering on-bill repayment to promote energy efficiency upgrades.
Key Resources	"On-Bill Loan Programs," U.S. Environmental Protection Agency (https://www.epa.gov/statelocalenergy/bill-loan-programs#:~:text=In%20on%2Dbill%20financing%20programs,specific%20customer%20and%20stakeholder%20needs). "EESI's On-Bill Financing Project," Environmental and Energy Study Institute (https://www.eesi.org/obf/main).

- **On-bill financing and tariffed on-bill repayment examples:** The examples highlighted reflect a mix of financing options across various stakeholder groups (traditional banks, state and local governments, private-sector third parties, and quasi-public entities).
  - NYSERDA: Green Jobs Green NY On-Bill Recovery Loan (https://www.nyserda.ny.gov/All-Programs/Residential-Financing-Programs): Monthly payments are set below the estimated average monthly costs; unsecured loan with terms of 5, 10, or 15 years; balance may be transferred when home is sold.
  - On-Bill Tariff: Ouachita Electric Cooperative (https://www.oecc.com/help): An on-bill tariff structure means there is no consumer loan, lease, or lien on the property.
  - Southern California Edison: On-Bill Financing for Energy Efficiency Projects (https://www.sce.com/business/tools/on-bill-financing): This on-bill program is for business customers, including multifamily building owners, to finance qualified energy efficiency projects interest-free and with no fees or loan costs for up to 10 years.

Residential Property Assessed Clean Energy (R-PACE)

R-PACE for Single-Family Homes Overview[8]	
Financing Option Overview	R-PACE enables property owners to finance energy efficiency, renewable energy, water conservation, and resilience upgrades through a special assessment placed on their property tax bill. Repayment is tied to the property instead of the individual.
Residential Sector Target Market	Single-family homeowners.
Key Stakeholders	City or county governments.
Financing Use Case	Energy efficiency, renewable energy, water conservation, and resilience upgrades.
State and Local Government Action	Municipalities may directly administer R-PACE programs or work through a public-private partnership with a PACE provider. Enabling or authorizing legislation may be needed. R-PACE has been implemented in a few states (i.e., California, Florida, Missouri). It has not been adopted widely due to concerns related to the senior-lien structure of R-PACE assessments and consumer protections related to the origination and repayment of R-PACE assessments, including disclosure of loan terms, homeowner ability to pay, and debt-to-income ratios. For many low-income households, financing without strong consideration of consumer protections can leave homeowners worse off, including the risk of losing their home if they become delinquent on an R-PACE assessment, which takes the form of a lien.
Key Resources	Updated Guidelines for Residential PACE Financing Programs, DOE (https://www.energy.gov/scep/slsc/articles/updated-guidelines-residential-pace-financing-programs).

[8] For more information about R-PACE, see https://www.energy.gov/scep/slsc/property-assessed-clean-energy-programs#:~:text=Residential%20PACE%20allows%20homeowners%20to%20finance%20energy%20efficiency%2C,legislation%2C%20and%20authorized%20at%20the%20local%20government%20level.

BIL and IRA: New Federal Funding Opportunities To Support Residential Energy Upgrades

New and existing programs funded under the Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) will support residential energy retrofits through grants, rebates, tax credits, and capital for state, local, Tribal, and nonprofit financing programs. Rebates and tax credits, in combination with affordable financing, can bridge the gap for households that lack access to other forms of capital to pay for home upgrades. Opportunities include:

- Rebates: Home Efficiency Rebates and Home Electrification and Appliance Rebates.
- Tax credits: Tax credits for qualifying residential energy efficiency home improvements (Section 25C of the U.S. Internal Revenue Code) and clean energy projects (25D of the U.S. Internal Revenue Code).
- Greenhouse Gas Reduction Fund: Competitive funding* available to state, local, and Tribal governments and non-government actors to invest in projects intended to reduce greenhouse gas emissions.
- Energy Efficiency Revolving Loan Fund Capitalization Grant Program: Formula funding* designed to provide capitalization grants to states to establish a revolving loan fund under which the state shall provide loans and grants for energy efficiency audits, upgrades, and retrofits.
- State Energy Program: Formula funding designed to provide funding to states to support electric transmission and distribution planning as well as planning activities and programs that help reduce carbon emissions in all sectors of the economy. Financing programs are eligible activities.
- Energy Efficiency and Conservation Block Grant Program: Formula and competitive funding designed to assist states, local governments, and Tribes in implementing strategies to reduce energy use, reduce fossil fuel emissions, and improve energy efficiency. Financing programs are eligible activities.
- Weatherization Assistance Program: Formula funding designed to increase the energy efficiency of dwellings owned or occupied by low-income persons, reduce their total residential energy expenditures, and improve their health and safety, especially for vulnerable, low-income persons.
- Green and Resilient Retrofit Program: Direct loans and grants to reduce greenhouse gas emissions and improve the energy and water efficiency and climate resilience of HUD-assisted multifamily properties serving low-income residents.

Learn more and find updates at the following websites:

- The White House's IRA website: www.cleanenergy.gov
- DOE's BIL website: www.energy.gov/bil/bipartisan-infrastructure-law-programs
- DOE's Office of State and Community Energy Programs (SCEP) website: www.energy.gov/scep/office-state-and-community-energy-programs
- HUD Funding Navigator website: www.hudexchange.info/programs/build-for-the-future/funding-navigator
- National Association of State Energy Officials' (NASEO's) IRA Resource Hub: www.naseo.org/issues/inflation-reduction-act.

*Competitive and formula funding are two types of federal assistance. Eligible entities compete for the available competitive funding based on the merit of their proposal. Eligible entities (i.e., states) do not compete for formula funding, and the amount of funds allocated for each entity are calculated by a formula.

Resources and Program Examples for Low- and Moderate-Income Households and Disadvantaged Communities

When exploring which financing mechanisms are best-positioned to serve different residential market segments, local and state governments are encouraged to ensure that policies and programs meet the needs of all constituents and equitable access and benefits are at the forefront of decision-making. It is important to keep in mind that the national average energy burden for low-income households is 8.6%, three times higher than for non-low-income households, which is estimated at 3%. In some areas, depending on location and income, energy burden can be as high as 30%.[9] Of all U.S. households, 44%, or about 50 million, are defined as low-income (SCEP n.d.). For many low-income households, financing without strong consideration of consumer protections can risk vulnerable homeowners. It is also critical to ensure low- and moderate-income families are not steered to financing improvements when they may otherwise qualify for low- or no-cost programs and to embed consumer protection mechanisms into financing programs to protect vulnerable households. The following grant-based and specialized financing options are best-positioned to serve low- and moderate-income households.

[9] According to DOE's Low-Income Energy Affordability Data (LEAD) Tool, members of the Navajo Nation Reservation with incomes less than 30% of the area median income have an energy burden of 30% (see https://www.energy.gov/scep/slsc/lead-tool for more information).

Resources for Low-Income Households

The following resources highlight issues and solutions for low-income households to deploy energy efficiency and renewable energy. Stakeholders can use these resources to support program planning and inform existing initiatives.

- DOE's LEAD Tool is designed to help states, communities, and other stakeholders create better energy strategies and programs by improving their understanding of low-income housing and energy characteristics through data, maps, and graphs (https://www.energy.gov/scep/slsc/lead-tool).
- DOE's Clean Energy for Low-Income Communities Accelerator Toolkit contains resources and models based on promising practices to help administrators reduce energy burden for low-income communities by expanding upon work funded through utility, state, or federal programs (https://betterbuildingssolutioncenter.energy.gov/CELICA-Toolkit).
- DOE's National Community Solar Partnership is a coalition of community solar stakeholders working to expand access to affordable community solar to every American household by 2025 (https://www.energy.gov/communitysolar/community-solar).
- The Biden Administration's Justice40 Initiative aims to deliver 40% of the overall benefits of relevant federal investments in climate and energy to disadvantaged communities (https://www.whitehouse.gov/environmentaljustice/justice40/). DOE's Energy Justice Dashboard (BETA) offers relevant tools and resources (https://www.energy.gov/justice/energy-justice-dashboard-beta).
- The White House Climate and Economic Justice Screening Tool is designed to help state and local governments and interested stakeholders identify disadvantaged communities that are marginalized, underserved, and overburdened by pollution (https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5).

Other Resources

Federal

- DOE's Weatherization Assistance Program[10]: Reduces energy costs for low-income households by increasing the energy efficiency of their homes, while ensuring their health and safety.
- The Department of Health and Human Services' Low Income Home Energy Assistance Program (https://www.acf.hhs.gov/ocs/programs/liheap): Provides federally funded assistance in managing costs associated with home energy bills, energy crises, weatherization, and energy-related minor home repairs.
- Low-Income Housing Tax Credit (https://www.huduser.gov/portal/datasets/lihtc.html): Gives state and local Low-Income Housing Tax Credit-allocating agencies $8 billion in annual budget authority to issue tax credits for the acquisition, rehabilitation, or new construction of rental housing targeted to lower-income households.
- U.S. Department of Agriculture Rural Energy Savings Program (https://www.rd.usda.gov/programs-services/electric-programs/rural-energy-savings-program): Provides loans to rural utilities and other companies who provide energy efficiency financing or repayment programs to qualified consumers to implement durable cost-effective energy efficiency measures.

State/Local Program Examples

- Milwaukee Energy Efficiency Program (https://city.milwaukee.gov/eco/Buildings-Energy/Homeowners): Milwaukee provides accessible, low-interest loans for energy-saving upgrades in a partnership with Summit Credit Union. This program offers several rebate incentives of up to $3,000, depending on the type of installation or improvement.
- City of Tallahassee Good Neighbor Program (https://liheapch.acf.hhs.gov/Utility/FL/talla.htm): Offers grants for ceiling insulation, code enforcement rehabilitation, and up to $500 in energy efficiency retrofit grants.
- Efficiency Vermont Home Energy Loan (https://www.efficiencyvermont.com/services/financing/homes/home-energy-loan): Finances 100% of energy efficiency projects that include heat pumps, weatherization improvements, health and safety repairs, appliances, and more. Interest rates are based on household income and the loan term, up to 15 years.
- NYSERDA EmPower+ (https://www.nyserda.ny.gov/All-Programs/EmPower-New-York-Program): Provides income-eligible homeowners with funding to cover the cost of eligible energy efficiency improvements. Low-income, single-family households are eligible for no-cost energy efficiency improvements capped at

[10] See https://www.energy.gov/scep/wap/weatherization-assistance-program#:~:text=The%20U.S.%20Department%20of%20Energy%20%28DOE%29%20Weatherization%20Assistance,approximately%2035%2C000%20homes%20every%20year%20using%20DOE%20funds.

$10,000 per project. Moderate-income single-family households are eligible for no-cost energy efficiency improvements capped at $5,000 per project.

- Tennessee Valley Authority Home Uplift (https://energyright.com/residential/home-uplift/): Funds no-cost energy improvements to individuals and households with limited means across the Tennessee Valley. The objective of the improvements is to reduce energy burdens, poverty, and carbon emissions while improving health outcomes and housing affordability.

Other Program Examples

- Craft3 (https://www.craft3.org/homeowner-loans/home-energy): Regional nonprofit community development organization that uses capital, relationships, and voice to build a thriving, just, and empowered Pacific Northwest. Craft3's Home Energy Loan has been used to finance energy upgrades, from better insulation to more efficient heating systems.
- The Solar and Energy Loan Fund (https://solarenergyloanfund.org/loan/the-self-loan/): Florida nonprofit organization working in communities throughout the state using the CDFI model. The Solar and Energy Loan Fund provides energy expertise and favorable financing to underserved residents and small businesses to yield sustainable community economic development opportunities.

Conclusion and Summary Tables

The residential sector presents significant potential for energy efficiency improvements. Inability to secure affordable financing often limits or prevents clean energy upgrades in multifamily and single-family residential homes. State and local governments can advance legislation that enables the development of new and expansion of existing energy efficiency financing to transition residential homes to low and no carbon, save families money, drive improvements in health outcomes, update aging infrastructure, and support investment in workforce and economic development. The following table highlights the various financing resources included in this document. For additional resources and support, visit DOE's State and Local Solution Center (https://www.energy.gov/scep/slsc/state-and-local-solution-center).

Financing Options Summary

Types of Financing (Levantis et al. 2016)		Residential Sector Target Market	State and Local Government Action	Borrower Benefits	Considerations	Use Cases for Financing
Traditional	**Unsecured loans**: Lenders cannot take possession of borrower's assets for nonpayment.	Single-family homeowners, multifamily residents, or property owners.	Establish and support green banks. Help utility companies and CDFIs establish loan programs. Set up revolving loan funds and other credit-enhancement vehicles, including leveraging public dollars to attract private capital.	No collateral requirement.	Higher interest rates than comparable secured loans.	Good for single-measure upgrades such as replacing HVAC equipment, for borrowers who might not have sufficient equity in their home, and during situations in which financing needs to be secured quickly.
	Secured loans: Lenders may take possession of borrower's assets for nonpayment.	Single-family homeowners, multifamily property owners.	Collaborate with state housing finance agency to offer EEMs, if not already, or on resolving challenges. Require energy performance disclosure at time of sale because it is a natural time for purchasers to identify upgrades and roll them into the mortgage. Develop credit enhancement mechanisms to support CDFIs' abilities to offer energy mortgages and home equity loans for improvements.	Lower interest rates.	Longer to execute, with higher transaction costs.	EEMs, home equity loans.

Types of Financing (Levantis et al. 2016)		Residential Sector Target Market	State and Local Government Action	Borrower Benefits	Considerations	Use Cases for Financing
	Leases: Lessor offers lessee possession and use of an asset for a fixed period of time.	Multifamily building owners, single-family homeowners.	Collaborate with private lenders to develop and administer programs that promote implementing energy efficiency projects through lease financing.	Lower transaction costs, flexible terms, and, compared to loans, there is usually a faster turnaround period and can cover a wide array of project costs, including installation.	Debt limitations.	Desirable for multifamily property owners who are limited in the amount of debt they can undertake. Single-family homeowners can avoid upfront system costs.
Specialized	**On-bill financing and tariffed on-bill repayment (also called inclusive utility investment programs)** : Program that allows utility customers to repay cost of energy upgrades on the utility bill.	Single-family homeowners or multifamily bill payers.	Develop policies that support on-bill programs, set up revolving loan funds to capitalize on-bill programs; municipal utilities could consider offering on-bill repayment to promote energy efficiency upgrades.	Paying on the utility bill is familiar and convenient. Building owners do not take on debt, because the amount is assigned to the meter, not individuals.	Startup costs and ongoing administrative complexity can be significant for utilities.	Whole-home retrofits that reduce energy bills or emergency HVAC and water heater replacements.
	C-PACE: Building owners finance qualifying improvements through a voluntary assessment placed on their property tax bill.	Multifamily building owners.	States can support enabling legislation and active programs. (Most C-PACE programs are currently privately financed.)	Beneficial for property owners not intending to own facilities long-term and who want to transfer financing obligations at time of sale.	Lender consent is a best practice.	Long-term (10+ year) project financing.

Types of Financing (Levantis et al. 2016)	Residential Sector Target Market	State and Local Government Action	Borrower Benefits	Considerations	Use Cases for Financing
R-PACE: Building owners finance qualifying improvements through a voluntary assessment placed on their property tax bill.	Single-family homeowners.	Municipalities may directly administer R-PACE programs or work through a public-private partnership with a PACE provider. Enabling or authorizing legislation may be needed.	Offers strong lender security, allowing long terms and lower rates relative to unsecured financing options. Repayment is attached to the home instead of the individual.	Regulatory challenges. Consumer protections needed.	Energy efficiency upgrades and renewable energy systems. Emergency HVAC and water heater replacement.
ESPC: Service provider takes on performance risk and guarantees energy savings.	Multifamily building owners (most common in public housing projects).	States can support enabling legislation, develop programs that provide technical assistance, facilitate procurement, and provide long-term project results tracking.	Lower project performance risk for building owners, guarantee of project savings, and access to technical and maintenance support.	Complex; especially suited for large projects; funding must be obtained from a third party.	Primarily large projects ($500,000+, preferably $5 million+), long-term financing (typically 10–20 years).

Additional Resources

- Clean Energy Financing Toolkit for Decisionmakers, U.S. Environmental Protection Agency (https://www.epa.gov/statelocalenergy/clean-energy-financing-toolkit-decisionmakers)
- State and Local Solution Center, DOE (https://www.energy.gov/scep/slsc/state-and-local-solution-center)
- *Current Practices in Efficiency Financing: An Overview for State and Local Governments*, Lawrence Berkeley National Laboratory (https://www.energy.gov/sites/default/files/2017/05/f34/current-practices-efficiency-financing.pdf)
- *Energy Efficiency Financing for Low- and Moderate-Income Households*, DOE (https://www.energy.gov/sites/default/files/2021-07/ee-financing-lmi.pdf)
- Buildings, NASEO (https://www.naseo.org/issues/buildings)
- *Supporting Energy Efficient Manufactured Homes with Loan Loss Reserves: Program Implementation Options for State Energy Offices*, NASEO (https://www.naseo.org/data/sites/1/documents/publications/NASEO_Energy-Efficient-Manufactured-Homes_v2.pdf)
- Database of State Incentives for Renewables & Efficiency, North Carolina Clean Energy Technology Center (https://www.dsireusa.org/).

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For more information, visit: energy.gov/eere

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