



# **Energy Efficiency Program Financing: Size of the Markets**

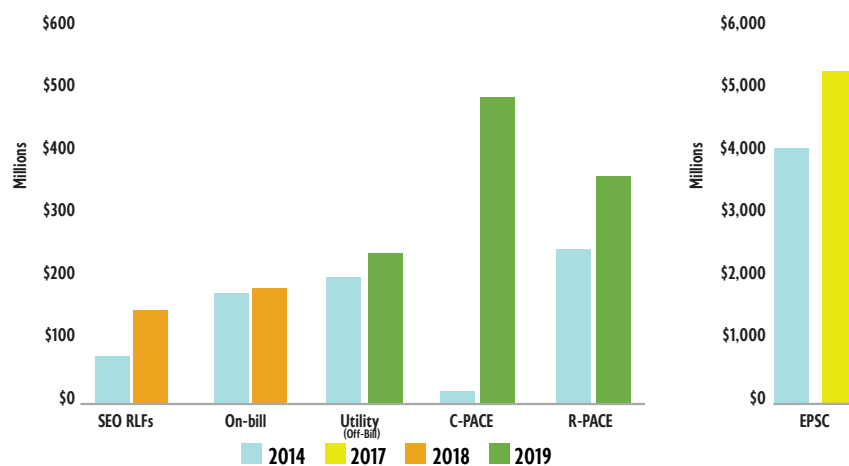
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**ACEEE**   
American Council for an Energy-Efficient Economy

# Key Findings

- Five major types of energy efficiency financing programs in the United States provide nearly \$7 billion in lending annually. This represents growth of more than 40% since 2014, the most recent year for which we have comprehensive lending volume data from these programs.
- Energy savings performance contracting (ESPC) is estimated to represent the vast majority—79%—of the total annual lending volume.
- Commercial PACE (C-PACE) and Residential PACE (R-PACE) programs account for \$489 million and \$366 million, respectively, of energy efficiency lending, around 13% of the total.
- Utility financing programs (on- and off-bill) account for \$424 million of the annual energy efficiency lending included in this research, or just over 6% of the total.
- State energy office (SEO) revolving loan funds (RLFs) account for \$146 million of the annual energy efficiency lending included in this research, or just over 2% of the total.
- Total loan volumes (non-ESPC) continue to be heavily driven by just a few programs. State-by-state and regional variation in efficiency finance programs remains mostly unchanged since 2014.
- While annual programmatic lending capital has generally been increasing, it is still at least an order of magnitude lower than the levels needed to meet decarbonization goals. Policy drivers are necessary to enable further growth in the programmatic sources that finance energy efficiency.

The figure below compares the energy efficiency lending volume estimates detailed in this research to 2014 lending volume.



**Annual programmatic energy efficiency lending volume. In this chart, the right-hand scale shows ESPC data only; the left-hand scale shows remaining five programs. Source: 2014 numbers reported from LBNL’s Energy Efficiency Program Financing (Deason et al. 2016).**



# Overview of the Efficiency Financing Landscape

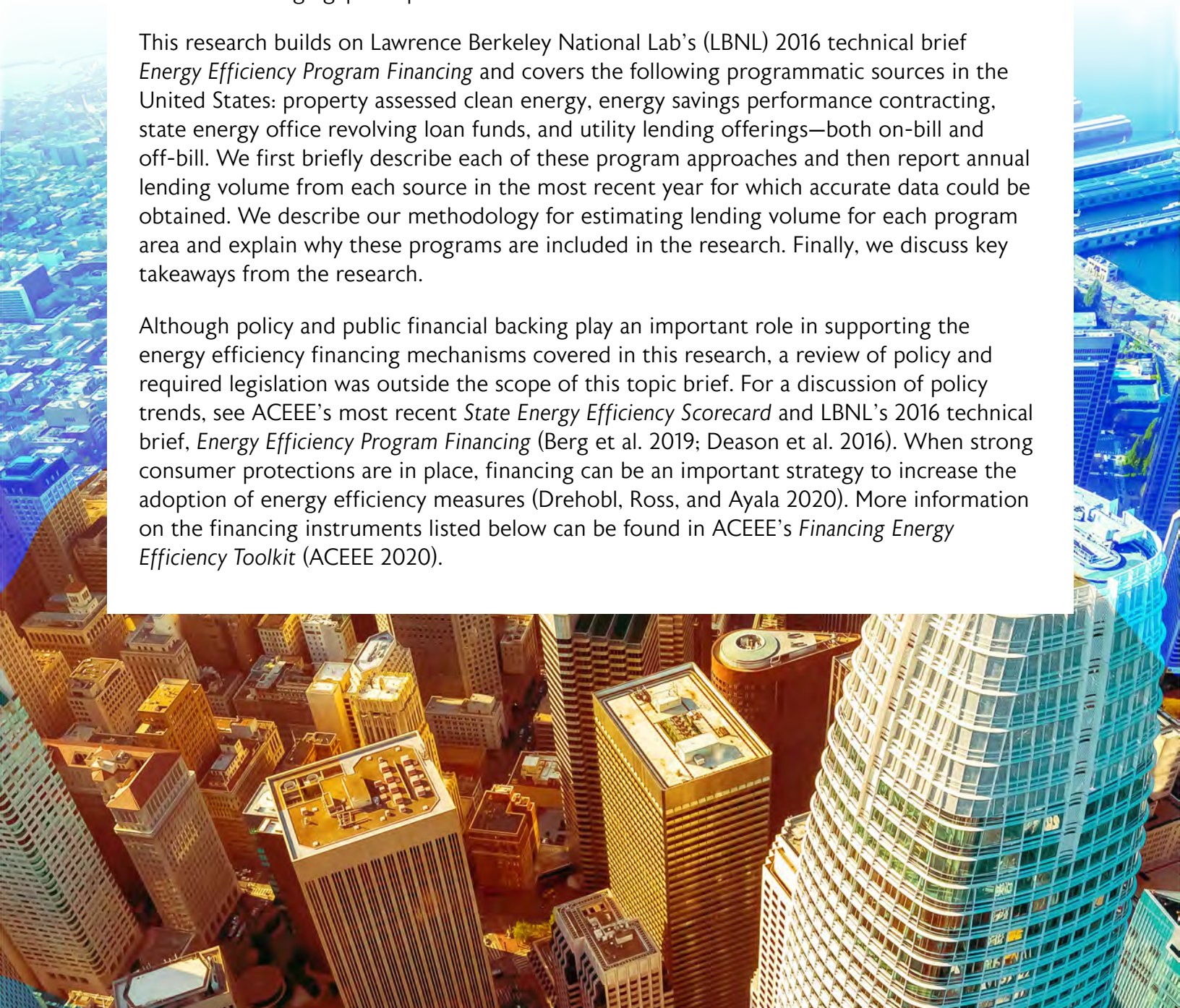
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## *Introduction and Objective of This Policy Brief*

Energy efficiency is critical to simultaneously achieve decarbonization goals and improve equity in energy affordability. This policy brief estimates the volume of residential and commercial energy efficiency financing from five programmatic sources. Energy efficiency financing programs typically aim to increase the scale of investment in energy efficiency, as grants, rebates, and other incentives alone will not be enough to reach efficiency goals and targets. Due to the decentralized nature of energy efficiency financing programs and the dearth of publicly available data, we have lacked sufficient information on the volume of recent annual lending to energy efficiency from programmatic sources. This brief aims to fill this knowledge gap and provide a baseline for future research.

This research builds on Lawrence Berkeley National Lab's (LBNL) 2016 technical brief *Energy Efficiency Program Financing* and covers the following programmatic sources in the United States: property assessed clean energy, energy savings performance contracting, state energy office revolving loan funds, and utility lending offerings—both on-bill and off-bill. We first briefly describe each of these program approaches and then report annual lending volume from each source in the most recent year for which accurate data could be obtained. We describe our methodology for estimating lending volume for each program area and explain why these programs are included in the research. Finally, we discuss key takeaways from the research.

Although policy and public financial backing play an important role in supporting the energy efficiency financing mechanisms covered in this research, a review of policy and required legislation was outside the scope of this topic brief. For a discussion of policy trends, see ACEEE's most recent *State Energy Efficiency Scorecard* and LBNL's 2016 technical brief, *Energy Efficiency Program Financing* (Berg et al. 2019; Deason et al. 2016). When strong consumer protections are in place, financing can be an important strategy to increase the adoption of energy efficiency measures (Drehobl, Ross, and Ayala 2020). More information on the financing instruments listed below can be found in ACEEE's *Financing Energy Efficiency Toolkit* (ACEEE 2020).



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

PACE is a financial instrument that enables long-term financing for energy efficiency, water efficiency, renewable energy, and resilience upgrades; depending on state and local legislation, it can be used to upgrade commercial (C-PACE) and/or residential (R-PACE) properties. Unlike a conventional loan, PACE financing is attached to the property and not the property owner. PACE financing is repaid by customers as an assessment on their property tax bill.

## ***State Energy Office (SEO) Revolving Loan Funds (RLFs)***

Many SEOs administer RLFs, from which loans are made to end users for eligible energy upgrades. RLFs are pools of capital from which funding is recycled via repayment of the loans by customers and then re-loaned for new projects.

## ***On-Bill Financing (OBF), On-Bill Repayment (OBR), and Tariffed On-Bill (TOB)***

OBF, OBR, and TOB programs include financing for energy efficiency that is paid back on the customer's utility bill as an additional line item. OBF utilizes ratepayer, utility, or public funds to capitalize efficiency loans, whereas OBR efficiency loans are funded by private capital. TOB is not technically debt, as the efficiency upgrades are assigned to the meter instead of the utility customer, but is paid back through an additional charge on the customer's utility bill. Many on-bill programs are administered by a private nonutility entity, though all the programs use the utility bill as the payback mechanism.

## ***Utility Financing Programs (in which loans are not paid back on-bill)***

Utility financing programs, administered by utilities (or a third-party administrator designated by the utility), lend capital to customers to fund energy efficiency projects. These programs generally utilize funds provided by ratepayers to capitalize loans, provide credit enhancements, or offer interest rate buydowns to customers. These programs act much like a conventional loan product, as capital is provided to cover the upfront costs of energy efficiency improvements and repaid with interest, generally at a below-market interest rate, over time.

## ***Energy Savings Performance Contracting (ESPC)***

An ESPC is a performance contract between an energy service company (ESCO) and a building owner, typically from the institutional market (state and local governments, K-12 schools, universities and colleges, hospitals, and agencies of the federal government). An ESCO can be defined as a company that provides energy efficiency-related and other value-added services and for which performance contracting is a core part of its energy efficiency services business. A performance contract typically guarantees energy and/or dollar savings, and ESCO compensation is linked to the level of savings achieved (Larson et al. 2018).



# Methodology

This research leverages LBNL's *Energy Efficiency Program Financing* technical brief, using it as a model for our methodology and a baseline for our findings. LBNL's report was published in June 2016 and reported on data from 2014; it remains the most comprehensive accounting of programmatic energy efficiency financing activity. This research aims to compare the size of the marketplace LBNL measured in 2014 to today's marketplace. The five programmatic sources were chosen to match LBNL's research scope and methodology.

In this report, *financing* generally refers to the provision of capital—which is paid back over time—to cover the upfront costs of energy efficiency upgrades to new or existing properties. This research does not cover grants, rebates, or other types of financial incentives.

Some energy efficiency financing programmatic sources fall outside the five categories listed in the previous section and are not covered in this brief. Examples include local municipal loan funds (e.g., San Antonio's Energy Efficiency Fund); private loan products, often offered by credit unions or community development financial institutions; and state programs run by agencies other than SEOs (e.g., the Washington State Housing Finance Commission's Energy Spark Home Loan program).

We report annual lending volume for the most recent year for which comprehensive data are available and for which estimates reflecting current market conditions could confidently be made.

PACE financing estimates were sourced from data provided by PACENation, a national nonprofit association that advocates for PACE financing. This research includes 2019 lending volume from all 46 active PACE programs that have funded programs across 18 states and the District of Columbia (PACENation 2019).

SEO RLF financing estimates were made from publicly available data and from direct outreach to program administrators; they reflect 2018 lending volume across 20 programs from 17 states identified that administer such a program. Program aggregation utilized work previously done by the National Association of State Energy Officials (NASEO 2020). Though we are confident that the aggregated data represent the vast majority of the market, we recognize that our research does not fully capture loan volume from every SEO RLF that fits our criteria. Our estimates should therefore be considered conservative.

On-bill financing estimates were made from publicly available data and from direct outreach to administrators and reflect 2018 lending volume from 40 on-bill programs. For simplicity and continuity with LBNL's methodology, TOB programs are included with OBF and OBR in this research. Program identification was guided largely by previous work by the Environmental Energy Study Institute (EESI 2020).

Estimates for utility financing programs (off-bill) were made from publicly available data and from direct outreach to administrators; they reflect 2019 lending volume from 14 programs. Programs operated by a third-party administrator but funded mostly via utility ratepayers (e.g., Mass Save Heat Loans) were included among utility financing programs.

For the utility programs, we recognize that the data collected do not *fully* reflect the market, and our estimates should be viewed as conservative. Some 100-plus known utility financing programs (on-bill and off-bill) are not included in this research because their annual loan volume data are not publicly available and we were unable to access these data via limited outreach to program administrators. The programs not included are estimated to have comparatively low annual loan volumes and collectively would not significantly affect total programmatic lending volume estimates.<sup>1</sup> We are highly confident that the largest programs by lending volume are included in this research.

For ESPC financing, we used research from LBNL, the International Energy Agency (IEA), and the U.S. Department of Energy (DOE) to estimate 2017 market activity; more recent data on ESPC project activity are largely unavailable.

Green banks have grown significantly in recent years, having generated more than \$5 billion in clean energy investment nationally since 2011, including \$1.5 billion in 2019 alone (CGC 2020). Financing provided by green banks to fund energy efficiency projects was indirectly, but not fully, captured in this research. Green banks play an important role in the abovementioned financing instruments. For example, six green banks administer a PACE program.<sup>2</sup> And at least four green banks have made capital commitments by way of contribution to a loan loss reserve or through direct allocation of funds to a utility- or PACE-financed project.<sup>3</sup> Likewise, green banks can dedicate funds and/or provide administrative support to utility programs and SEO RLFs. However, it was outside the scope of this study to fully analyze the extent to which the energy efficiency lending volume captured herein was facilitated or supported by green banks.

To view a full list of programs included in this research, please see Appendix A. For a list of known utility finance programs (both on-bill and off-bill) not included in this research, please see Appendix B.

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<sup>1</sup> A comprehensive data request process to program administrators to obtain loan volume was outside the scope of this research.

<sup>2</sup> Connecticut Green Bank, DC Green Bank, Florida Solar and Energy Loan Fund, New York City Energy Efficiency Corporation, Delaware Sustainable Energy Utility, and Rhode Island Infrastructure Bank.

<sup>3</sup> California Alternative Energy and Advanced Transportation Financing Authority, Connecticut Green Bank, Maryland Clean Energy Center, and NY Green Bank.

# Overview of the Findings

Table 1, below, lists our annual loan volume estimates for the five programmatic sources included in this research for the most recent year for which comprehensive data were available. Table 2 lists annual loan volume estimates for 2014. For comparison, figure 1, below, compares our lending volume estimates to 2014 volume.

Table 1. Energy efficiency lending volume estimates

Program type	Total annual loan volume (millions)	Year	Number of programs included
On-bill	\$183	2018	40
Utility (off-bill)	\$241	2019	14
PACE	\$855	2019	46
SEO	\$146	2018	20
ESPC	\$5,275	2017	n/a

Table 2. 2014 lending volume estimates

Program type	Total annual loan volume (millions)	Year	Number of programs included
On-bill	\$179	2014	29
Utility (off-bill)	\$196	2014	41
PACE	\$267	2014	19
SEO	\$74	2014	12
ESPC	\$4,101	2014	n/a

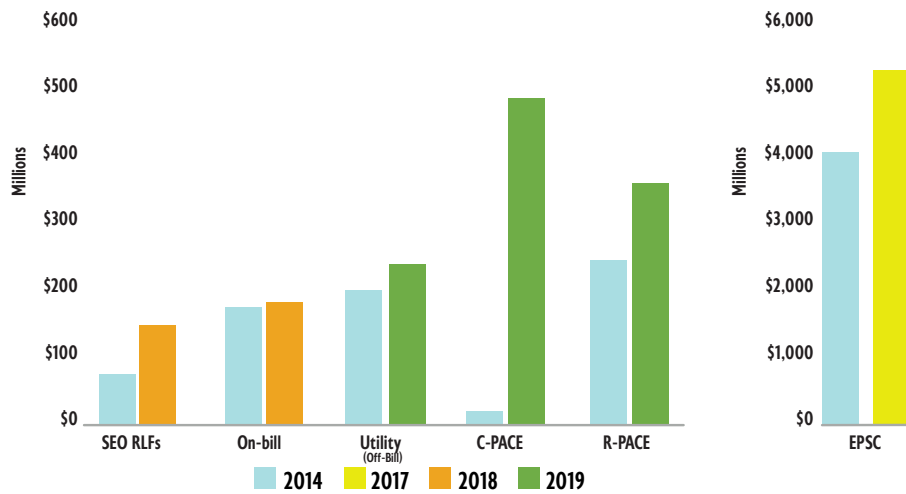


Figure 1. Annual programmatic energy efficiency lending volume. In this chart, the right-hand scale shows ESPC data only; the left-hand scale shows remaining five programs. Source: 2014 numbers reported from LBNL's *Energy Efficiency Program Financing* (Deason et al. 2016).



## PACE Energy Efficiency Lending Estimates

Total lending volume to finance energy efficiency projects via PACE financing in 2019 is estimated to be \$855 million: \$489 million via C-PACE and \$366 million via R-PACE. PACE programs also provide financing for renewable energy, water-saving, and resilience projects, but these estimates include lending volume only for energy efficiency upgrades. C-PACE surpassed R-PACE in annual energy efficiency investment for the first time in 2019.

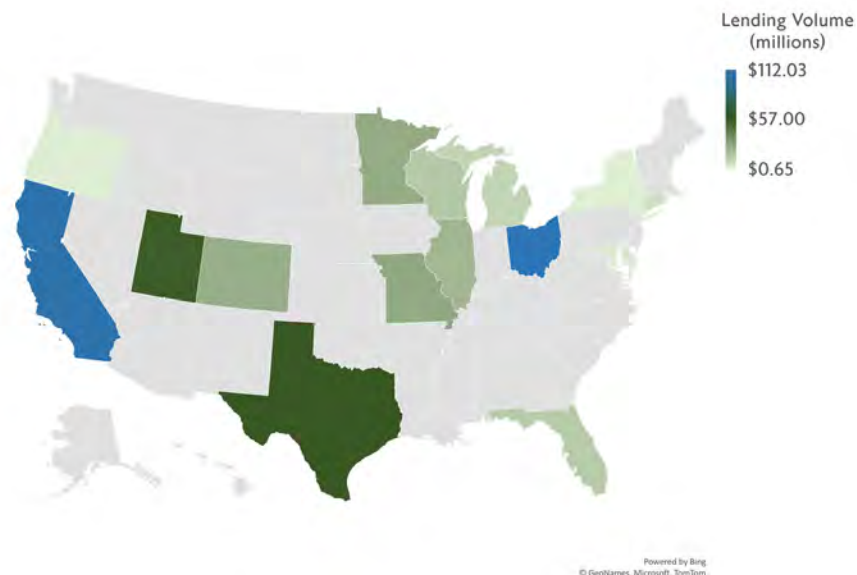
**Table 3: Annual PACE energy efficiency lending estimates (millions)<sup>4</sup>**

Program	2017	2018	2019
C-PACE	\$165	\$184	\$489
R-PACE	\$988	\$592	\$366
PACE Total	\$1,153	\$776	\$855

Annual energy efficiency financing via C-PACE has increased from just under \$19 million in 2014 to \$489 million in 2019, for an increase of nearly 2,500% (Deason et al. 2016). The C-PACE market for financing energy efficiency has grown every year since 2011, with 2019 marking the largest annual increase by a significant margin at \$305 million.

This significant increase in 2019 can be attributed mostly to the large gain in investment in California, Ohio, and Texas. Likewise, 2019 saw the largest-ever PACE-financed project, a \$54 million investment in the Salt Place Convention Center in Salt Lake City, Utah (PACENation 2020). Ohio and California are the two largest markets for C-PACE, accounting for 23% and 20%, respectively, of total C-PACE energy efficiency investment from 2017 through 2019.

See figure 2, below, for a regional perspective of 2019 energy efficiency investments financed via C-PACE.



**Figure 2. C-PACE energy efficiency lending volume in 2019. Source: Data provided by PACENation.**

<sup>4</sup> PACE lending estimates are calculated from program data aggregated and shared with ACEEE by PACENation.



R-PACE experienced a significant decline in annual financing for energy efficiency projects, from nearly \$1 billion in 2017 to \$366 million in 2019.<sup>5</sup> One of the reasons for the decline in 2018 was that consumer protection laws related to R-PACE began to go into effect in California on January 1, 2017 (California State Assembly 2016a, 2016b, 2020).<sup>6</sup> California's legislative action likely had a large impact on national figures because nearly 70% of energy efficiency financing via R-PACE has historically originated in California. However, R-PACE may be positioned for growth and diversification in 2020, with programs in development in Ohio and New York (PACENation 2020).

Overall, financing via PACE has experienced a period of massive growth since 2014. As more programs emerge around the country and as market awareness increases, this trend should continue. Thirty-seven states and the District of Columbia have enacted PACE-enabling legislation. C-PACE programs are active in 18 states and the District of Columbia, while R-PACE is currently offered in 3 states: California, Florida, and Missouri (PACENation 2019). PACENation presents an investment scenario in which the overall PACE market will reach \$30 billion of cumulative investment by 2025 (PACENation 2020).<sup>7</sup>

### ***State Energy Office (SEO) Revolving Loan Fund (RLF) Energy Efficiency Lending Estimates***

In 2018, \$146 million worth of energy efficiency projects were funded by 20 SEO RLF programs from 17 states. This represents growth of 97% compared with the LBNL estimated loan volume of \$74 million from 12 programs for 2014.

The Texas LoanSTAR Revolving Loan Program leads the way with \$42 million of loans issued in 2018, primarily financing energy-related, cost-reduced retrofits of facilities supported by the state, including public school districts and public colleges and universities. Since its inception in 1988, the LoanSTAR program has funded more than 325 loans totaling more than \$545 million (Texas SECO 2020).

Most energy efficiency projects financed through SEO RLFs are for major upgrades at public facilities. The notable exceptions are the New York State Energy Research and Development Authority's (NYSERDA) Smart Energy Loans, which finance residential energy upgrades, and Nebraska's Dollar and Energy Savings Loan Program, where more than 90% of all energy efficiency projects are for residential improvements (NDEE 2020).

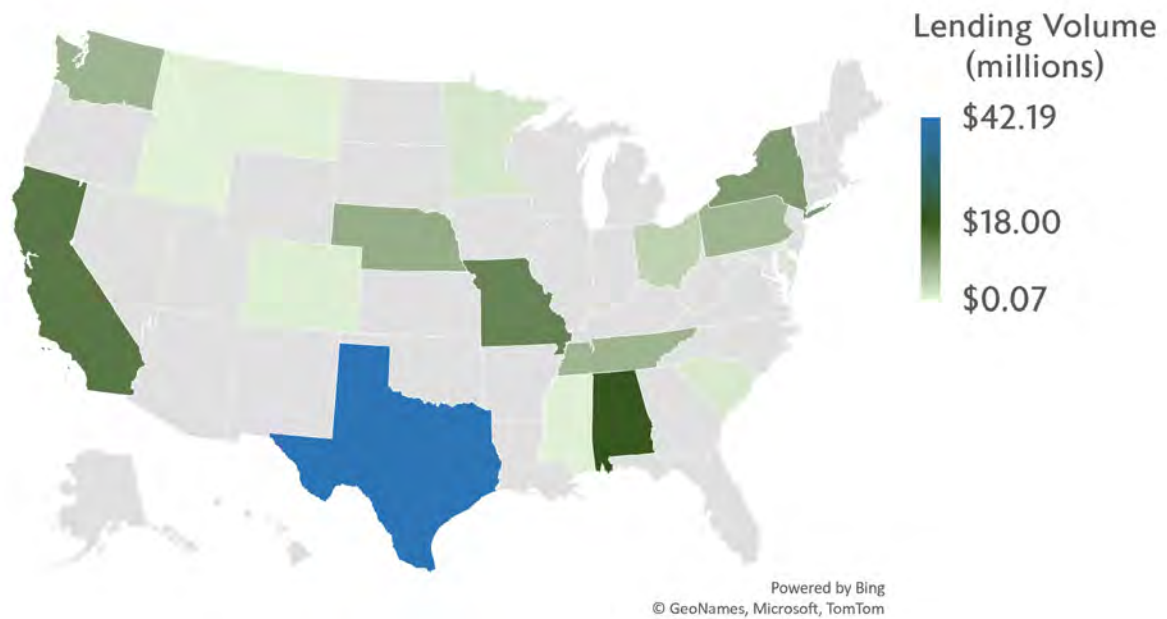
Annual loan volume for projects funded through SEO RLF programs can be volatile, as it depends on paybacks of previous loans, availability of capital, and project needs and priorities. For example, the Texas program funded just under \$6 million of projects in 2017 after outlays totaling \$42 million in 2018.

<sup>5</sup> Annual project investment financed via R-PACE had achieved growth every year between 2012 and 2017. Project investment dropped by 40% in 2018.

<sup>6</sup> For more details on the impact and development of consumer protection laws, please see the work of PACENation and the National Consumer Law Center (PACENation 2017; NCLC 2019).

<sup>7</sup> These projections include funding for renewable energy, water conservation, and resilience projects in addition to energy efficiency.

See figure 3, below, for a regional perspective on 2018 energy efficiency investments financed via SEO RLFs.



**Figure 3. Annual SEO RLF energy efficiency lending volume in 2018. Source: Publicly available data and direct outreach to program administrators.**

### ***On-Bill Energy Efficiency Lending Estimates***

In 2018 an estimated \$183 million worth of energy efficiency projects were funded by the 40 on-bill financing programs included in this research. Residential properties accounted for around \$97 million of the total, and nonresidential properties accounted for the remaining \$86 million. Pacific Gas and Electric financed \$37.8 million in loans in 2018, making it the largest OBF program in the country by loan volume. The four California investor-owned utilities accounted for just under 37% of the 2018 on-bill efficiency lending included in this research.<sup>8</sup>

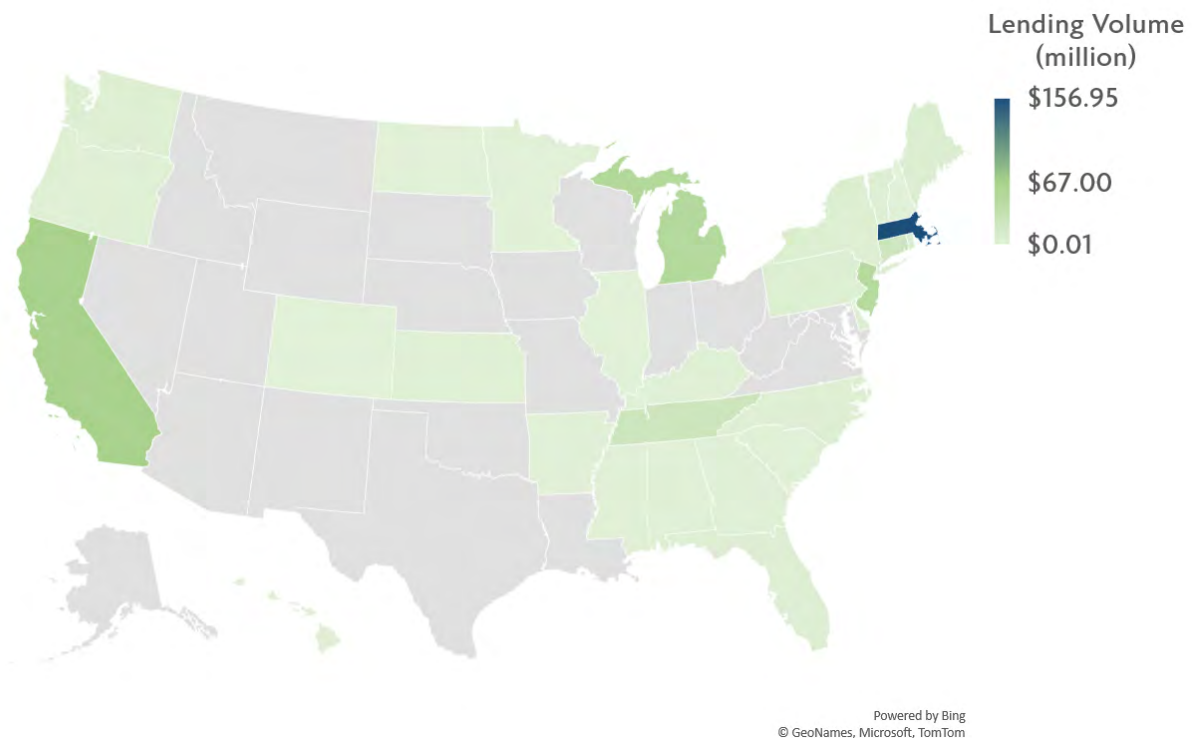
The Environmental Energy Study Institute has identified 110-plus utilities that operate on-bill programs. A majority of these are rural electric cooperatives, 15 of which are included in this research because their loan volume was reported publicly or obtained from program administrators. Most of these programs are funded with capital provided by the U.S. Department of Agriculture’s Rural Utilities Energy Savings Program. The largest of the 15 included rural cooperative programs, Brunswick Electric Membership Corp. in North Carolina, financed \$1.5 million of energy efficiency projects in 2018, while the smallest program included, Adams Electric Cooperative in Pennsylvania, financed \$56,000 in energy efficiency projects. Please see Appendix A for a list of programs included and Appendix B for a list of programs identified, but for which loan volume was not obtained.

<sup>8</sup> Pacific Gas and Electric, San Diego Gas and Electric, Southern California Edison, and Southern California Edison.

## Utility Financing Programs (Off-Bill) Energy Efficiency Lending Estimates

In 2019, \$241 million worth of energy efficiency projects were funded by the 14 utility financing programs (off-bill) included in this research. Of the total, more than \$218 million was for residential properties and the remainder, just under \$23 million, was for nonresidential properties. Massachusetts's Mass Save Heat Loan program continues to be the largest utility energy efficiency financing program in the country. It financed 13,433 loans for a total of \$157 million in 2019, which represents 65% of the utility financing loan volume included in this research (Mass Save 2019).

See figure 4, below, for a regional perspective on annual energy efficiency investments financed via utility programs (on- and off-bill).



**Figure 4. Annual utility program energy efficiency lending volume. This map represents lending volume data estimates from on-bill programs for 2018 and off-bill utility lending programs for 2019. Source: Publicly available data and direct outreach to program administrators.**



## *ESPC Energy Efficiency Lending Estimates*

For 2017 we estimate that total ESPC loan volume to finance energy efficiency projects was approximately \$5.3 billion. This represents a growth of 29% relative to the LBNL estimated loan volume of \$4.1 billion for 2014 (Deason et. al. 2016).

**Table 4. ESPC efficiency lending estimates**

<b>Year</b>	<b>Total ESCO revenue (millions)</b>	<b>Total ESPC loan volume (millions)</b>
<b>2011</b>	<b>\$5,300</b>	<b>\$3,943</b>
<b>2014</b>	<b>\$6,000</b>	<b>\$4,101</b>
<b>2017</b>	<b>\$7,500</b>	<b>\$5,275<sup>9</sup></b>

Historically, the federal market has represented 25% of ESPC investments tracked by LBNL and the National Association of Energy Service Companies (Carvallo et al. 2019). Project investment in federal ESPC projects saw an increase of \$258 million between 2014 and 2017, from \$453 million to \$711 million (DOE 2020). This increase is well aligned to our estimate of a 29% gain in total loan volume via ESPCs over the same period.

<sup>9</sup> The estimated annual revenue of the U.S. ESCO industry was \$7.5 billion in 2017 (Larson et al. 2018). The estimated annual revenue of the U.S. ESCO industry was \$5.3 billion in 2011 and \$6.0 billion in 2014, and the total loan volume was \$3.8 billion in 2011 and \$4.1 billion in 2014 (Deason et al. 2016). We multiplied the percentage of loan volume relative to total revenue from 2011 (72%) and 2014 (68%) by 2017's estimated ESCO revenue of \$7.5 billion to determine a range of annual lending volume for 2017 of \$5.1 billion to \$5.4 billion, with \$5.3 billion representing the average of the two.

## Conclusion

The largest and most robust programs in this research primarily leverage private capital sources to fund their loan portfolios. For example, the Massachusetts Heat Loan utility lending program utilizes a network of approximately 60 local institutions to fund its nearly \$160 million energy efficiency loan portfolio (Kramer et al. 2015). Likewise, a vast majority of PACE and ESPC loans are sourced from private capital providers.

According to analysis by the Natural Resources Defense Council and Energy + Environmental Economics (a consulting firm), to help achieve aggressive climate goals (80% greenhouse gas emissions reductions and 50% energy reductions by 2050), the United States must invest about \$150 billion each year in energy efficiency and efficient electrification of the buildings sector, and \$115 billion annually in transportation sector efficiency (Gowrishankar and Levin 2017). Major additional investment is also needed to improve the efficiency of the industrial sector (Whitlock, Elliott, and Rightor 2020). However, current public and private investments pale in comparison with the need. Ratepayer-funded efficiency investments have been about \$8 billion per year (Berg et al. 2019). A more expansive and generous view of U.S. efficiency investments, beyond just programmatic sources, would put the estimated total between \$60 billion and \$115 billion per year across buildings, transportation, and industry. Even that is just a fraction of the need (Nadel 2017). Financing allows our country to scale up the level of energy efficiency investment much more quickly than would be possible with only cash payments or reliance solely on public dollars. The estimated \$7 billion in annual programmatic financing for efficiency investments reflects a helpful increase compared with prior years, but needs to increase by at least an order of magnitude to meet the level of efficiency upgrades necessary to help reach our climate goals.



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# Appendix A: Programs Included in Research

Table A1. PACE programs included in research

State	Program	Sector
AR	Arkansas Advanced Energy Equity Program (A2E2)	Commercial
CA	CaliforniaFIRST	Residential, commercial
	Commercial PACEDirect (CleanFund)	Commercial
	Counterpointe Energy Solutions	Residential, commercial
	FortiFi	Residential
	Figtree Financing	Commercial
	GreenFinance San Francisco	Commercial
	Greenworks Lending	Commercial
CA	HERO Program	Residential
	LA County Commercial PACE	Commercial
	mPower	Residential, commercial
	PACE Funding	Residential, commercial
	Petros PACE Finance	Commercial
	Samas Capital PACE	Commercial
	Sonoma County Energy Independence Program	Residential, commercial
Ygrene	Residential, commercial	
CO	CO C-PACE	Commercial
CT	CT C-PACE	Commercial
DC	DC PACE	Commercial
FL	Counterpointe Energy Solutions	Residential, commercial
	Leon County PACE	Commercial
	RenewPACE	Residential, commercial
	Solar Energy Loan Fund	Commercial
	Ygrene	Residential, commercial
KY	Energize KY	Commercial
MD	MD PACE	Commercial
	Montgomery County PACE	Commercial
MI	Lean & Green MI	Commercial
MN	MinnPACE	Commercial
	Southwest Regional Development Commission	Commercial
MO	Missouri Clean Energy District	Residential, commercial
	Missouri Energy Savings Program	Residential, commercial
	Set the PACE St. Louis	Residential, commercial
	Show Me PACE	Commercial

State	Program	Sector
NE	Omaha PACE	Commercial
NY	Energize NY	Commercial
OH	Columbus PACE	Commercial
	NOPEC PACE	Commercial
	Ohio PACE	Commercial
	Toledo Port Authority Better Buildings Northwest Ohio	Commercial
OR	PropertyFit Oregon	Commercial
RI	RI C-PACE	Commercial
TX	Texas PACE Authority	Commercial
UT	UT C-PACE	Commercial
WI	Milwaukee PACE	Commercial
	PACE WI	Commercial

Table A2. SEO RLF programs included in research

State	Program	Sector
AL	AlabamaSAVES	Commercial
	Energy Conservation Assistance Act Loan Program	Public
CA	Energy Conservation Assistance Act Loan Program—Ed	Public
	Energy Efficient State Property Revolving Loan Fund	Public
CO	RENU	Residential
DE	Energy Efficiency Investment Fund	Commercial
ID	Idaho State Energy Loan Program	Multiple
MI	Energy Efficiency Revolving Loan Fund	Commercial, public
MN	Trillion BTU Program	Commercial
MO	Missouri Energy Loan Program	Public
MT	Alternative Energy Revolving Loan Program	Commercial, residential
NE	Dollar and Energy Savings Loan Program	Commercial, public, residential
NY	Smart Energy Loans	Residential
OH	Energy Loan Fund	Commercial, public
PA	Green Energy Loan Fund	Commercial, public
SC	Conserfund	Public
	ConserFund Plus	Public
TN	Pathway Lending Energy Efficiency Loan Program	Public, commercial
TX	LoneSTAR Revolving Loan Program	Public
WA	Clean Energy Fund	Public



Table A3. Utility programs (on-bill) included in research

State	Program	Utility and/or program admin.	Sector
AL, GA, KY, MI, NC, TN, VA	EnergyRight Solutions Program	Tennessee Valley Authority/EnergyRight	Residential
AR	HELP PAYS	Ouachita Electric Cooperative, EEtility	Residential, commercial
	Ozarks Electric Cooperative HELP Pay as You Save Program	Ozarks Electric Cooperative	Residential
CA	Energy Efficiency Retrofit Loan Program	Pacific Gas and Electric Company	Residential, commercial
	Green Hayward PAYS	City of Hayward	Residential
	OnBill Financing for Business	San Diego Gas and Electric	Commercial
	Southern California Edison	Southern California Edison	Commercial
	Zero Percent On-Bill Financing	Southern California Gas Company	Commercial
CO	Fort Collins Utilities Residential On-Bill Financing Program	Fort Collins Utilities	Residential
CT	eHEAT Loan	Capital for Change	Residential
	SmartE Loan	Capital for Change	Residential
	HES&LL	Capital for Change	Residential
FL	Efficiency Loan Program	City of Tallahassee Electric Utility	Residential
GA	Habersham EMC How\$mart Program	Habersham Electric Membership Corporation	Residential
HI	GEM\$	Hawaii Green Infrastructure Authority	Residential, commercial
IL	Illinois Energy Loan Program	Slipstream	Residential
	Illinois Electric Rural Cooperative Energy Efficiency Loan Program	Illinois Electric Rural Cooperative	Residential
KS	Midwest Energy How\$mart Kansas	Midwest Energy Inc.	Residential, commercial
KY	How \$mart	Big Sandy RECC, Grayson Electric Co-op, Fleming Mason Energy, Jackson Energy Co-op, Farmers RECC, Licking Valley RECC, Mountain Association for Community Economic Development	Residential
MI	Holland Energy Fund	Slipstream	Residential
MN	Otter Tail Power Company—DollarSmart Energy Efficiency Loan Program	Otter Tail Power Company	Residential
NH	Smart Start	Eversource	Public
NC	Brunswick Electric Membership Corporation Residential Weatherization Program	Brunswick Electric Membership Corporation	Residential, commercial
	Four County EMC Comfort Loan Program	Four County EMC	Residential
	Roanoke Electric Cooperative Upgrade to \$AVE	EEtility	Residential

State	Program	Utility and/or program admin.	Sector
ND	Burke-Divide Electric Cooperative Low Interest Loans	Burke-Divide Electric Cooperative	Residential
NJ	South Jersey Residential Loan Program	Slipstream	Residential
	South Jersey Commercial Loan Program	Slipstream	Commercial
	Economic Energy Efficiency Extension Program	Public Service Enterprise Group	Commercial
	SAVEGREEN Project	New Jersey Natural Gas	Residential
NY	NYSERDA On-Bill Recovery Financing	NYSERDA	Residential, commercial
OR	Eugene Water and Electric Board Energy Efficiency Loans	Eugene Water and Electric Board	Residential
	Energy Saver Loan Program	Umatilla Electric Cooperative	Residential
PA	Valley Electric Cooperative ERC Loan Program	Valley Electric Cooperative	Residential, commercial
	Adams Electric Energy Resource Conservation and Supplemental Loan Program	Adams Electric Cooperative	Residential
RI	Electric LC&I Revolving Loan Fund	Rhode Island Energy Efficiency & Resource Management Council	Commercial
SC	Help My House	Electric Cooperatives of South Carolina	Residential
WA	Clark Public Utilities Residential Weatherization Services	Clark Public Utilities	Residential
	Switch It Up On-Bill Program	Orcas Power & Light Co-op	Residential, commercial
	Richland Energy Services—Residential Energy Conservation & Solar Loan Program	Richland Energy Service	Residential

Table A4. Utility programs (off-bill) included in research

State	Program	Utility and/or program admin.	Sector
CA	Residential Energy Efficiency Loan Assistance Program	California Alternative Energy and Advanced Transportation Financing Authority	Residential
	Small Business Energy Efficiency Financing Program	California Alternative Energy and Advanced Transportation Financing Authority	Commercial
	Sacramento Municipal Utility District—Commercial Energy Efficiency Loan Program	Sacramento Municipal Utility District	Commercial
CT	Energy Conservation Loan Program	Capital for Change	Residential
DE	Energize Delaware Revolving Loan Program	Energize Delaware	Commercial, public
MA	Mass Save Heat Loan Program	Mass Save	Residential
ME	Home Energy Savings Program	Efficiency Maine	Residential
MI	Michigan Saves Offerings	Michigan Saves	Commercial, residential
NJ	New Jersey Clean Energy Program’s Home Performance with ENERGY STAR® Loan	Slipstream	Residential
OR	Savings Within Reach Loan Program	Energy Trust of Oregon, Craft3	Residential
RI	Rhode Island Efficient Buildings Fund	National Grid, RIIB, OER	Public
	Small Business Revolving Loan Fund	Rhode Island Energy Efficiency & Resource Management Council	Commercial
VT	Heat Saver Loan/Home Energy Loan	Efficiency Vermont	Residential
	Business Energy Loan	Efficiency Vermont	Commercial

# Appendix B: Programs Not Included in Research

Table A5: Known utility programs not included in research

State	Program	Utility and/or program admin.	Sector
AR	Arkansas Valley Electric Cooperative HELP Loan Program	Arkansas Valley Electric Cooperative	Residential
	Craighead Electric Cooperative HELP Loan Program	Craighead Electric Cooperative	Residential
	First Electric Cooperative Home Improvement Loans	First Electric Cooperative	Residential
	North Arkansas Electric Cooperative Energy Efficiency Loans	North Arkansas Electric Cooperative	Residential
	Southwest Arkansas Electric Cooperative 5% ERC Loan Program	Southwest Arkansas Electric Cooperative	Residential
AL	Cullman Electric Cooperative Energy Conservation Loan Program	Cullman Electric Cooperative	Residential
	Central Alabama Electric Cooperative Efficiency Loan Program	Central Alabama Electric Cooperative	Residential
	Cherokee Electric Cooperative	Cherokee Electric Cooperative	Residential
	Covington Electric Cooperative CRS Energy Efficiency Loan Program	Covington Electric Cooperative	Residential
	Dixie Electric Cooperative Energy Resource Conservation Loan	Dixie Electric Cooperative	Residential
	North Alabama Electric Cooperative	North Alabama Electric Cooperative	Residential
	Pea River Electric Energy Resource Conservation Loans	Pea River Electric	Residential
	Sand Mountain Electric Cooperative	Sand Mountain Electric Cooperative	Residential
	Smart Financing	Alabama Power	Residential
	South Alabama Electric Cooperative Energy Resources Conservation Loan	South Alabama Electric Cooperative	Residential
	Wiregrass Electric Cooperative	Wiregrass Electric Cooperative	Residential
AZ	Sulphur Springs Valley Electric Cooperative Energy Efficiency Upgrade Loans	Sulphur Springs Valley Electric Cooperative	Residential
CA	Plumas-Sierra Electric Cooperative	Plumas-Sierra Electric Cooperative	Residential
CO	Holy Cross Energy—On Bill Financing	Holy Cross Energy	Residential, commercial
	San Luis Valley Rural Electric Co-op	San Luis Valley Rural Electric Co-op Weatherization and Energy Savings Program	Residential
FL	City of Tallahassee Utilities—Energy Efficiency Loans	City of Tallahassee Utilities	Residential
	Clay Electric Cooperative Loan Program	Clay Electric Cooperative	Residential
	REenergize Lakeland Loan Program	Lakeland Utilities	Residential



State	Program	Utility and/or program admin.	Sector
GA	Altamaha EMC	Altamaha EMC	Residential
	Coastal EMC HomePlus Program	Coastal EMC	Residential
	Cobb EMC Energy Matters Efficiency Loan	Cobb EMC	Residential
	Coweta-Fayette EMC—Home Plus Loan Program	Coweta-Fayette EMC	Residential
	Jackson EMC Home Plus Loan Program	Jackson Electric Membership Corporation (EMC)	Residential
	Southern Rivers Energy	Southern Rivers Energy	Residential
	Walton EMC HomePlus Program	Walton EMC	Residential
IA	Harrison County Rural Electric Cooperative	Harrison County Rural Electric Cooperative	Residential
	Guthrie County Rural Electric Cooperative Energy Resource Conservation Loans	Guthrie County Rural Electric Cooperative	Residential
	Midland Power Cooperative Howard Low-Interest Loans	Midland Power Cooperative	Residential
	Northwest REC Energy Efficiency Loans	Northwest REC	Residential
ID	Idaho Falls Power—Energy Efficient Heat Pump Loan Program	Idaho Falls Power	Residential
IL	Adams Electric Cooperative EnergyWyse Loan Program	Adams Electric Cooperative	Residential
	Eastern Illini Electric Cooperative Energy Wise Home Loan Program	Eastern Illini Electric Cooperative	Residential
	Southwestern Electric Cooperative Energy Resource Conservation (ERC) Loan Program	Southwestern Electric Cooperative	Residential
	Western Illinois Electric Cooperative ERC loans	Western Illinois Electric Cooperative	Residential
KY	Inter-County Energy Efficiency Loan Program	Inter-County Energy Cooperative	Residential
LA	Dixie Electric Membership Corporation (DEMCO) ERC Loan	Dixie Electric Membership Corporation (DEMCO)	Residential
MI	Cherryland Electric Cooperative On-Bill Pilot	Cherryland Electric Cooperative	Residential
	Thumb Electric Cooperative Energy Efficiency Loan Program	Thumb Electric Cooperative	Residential
MN	Federated Rural Electric Cooperative—ERC loan	Federated Rural Electric Cooperative	Residential
	Minnesota Valley Electric Cooperative Energy Resource Conservation (ERC) Loan	Minnesota Valley Electric Cooperative	Residential
	Stearns Electric Association ERC Loan Program	Stearns Electric Association	Residential
	Traverse Electric Energy Resources Conservation (ERC) Loans	Traverse Electric	Residential
MO	City Utilities of Springfield Advance Energy Pilot	City Utilities of Springfield	Residential

State	Program	Utility and/or program admin.	Sector
NC	Blue Ridge EMC—Energy Saver Loan Program	Blue Ridge Electric Membership Cooperative	Residential
	French Broad EMC Mini-Split Heat Pump Program	French Broad EMC	Residential
	Haywood EMC—Residential Heat Pump and Weatherization Loan Program	Haywood EMC	Residential
	Lumbee River EMC—Residential Weatherization Loan Program	Lumbee River EMC	Residential
	Tideland EMC Weatherization Loans	Tideland EMC	Residential
	Union Power Cooperative—Residential Energy-Efficient Heat Pump Loan Program	Union Power Cooperative	Residential
ND	Capital Electric Energy Resource Conservation (ERC) Loans	Capital Electric Cooperative	Residential
	Low-Interest Loans	Dakota Valley Electric Cooperative	Residential
	KEM Electric Cooperative ERC Loan Program	KEM Electric Cooperative	Residential
	Mor-Gran-Sou Electric Cooperative ERC	Mor-Gran-Sou Electric Cooperative	Residential
	Mountrail-Williams Electric Cooperative ERC Loan Program	Mountrail-Williams Electric Cooperative	Residential
	Nodak Electric Cooperative Low-Interest Loans	Nodak Electric Cooperative	Residential
	Northern Plains EC—Residential and Commercial Energy Efficiency Loan Program	Northern Plains EC	Residential, commercial
NH	New Hampshire Electric Co-op (NHEC) Smart Start Program	New Hampshire Electric Co-op	Residential, commercial
NM	Lea County Electric Cooperative Energy and Weatherization Loans	Lea County Electric Cooperative	Residential
	Energy Efficiency Loans	Roosevelt County Electric Cooperative	Residential, commercial and industrial
OH	Butler Rural Electric Cooperative Energy-Efficient Improvement Loan Program	Butler Rural Electric Cooperative	Residential
OK	Alfalfa Electric Cooperative Energy Resource Conservation Loans	Alfalfa Electric Cooperative	Residential, commercial
	Choctaw Electric Cooperative Energy Efficiency Loans	Choctaw Electric Cooperative	Residential
	Northwestern Electric Cooperative Energy Resource Conservation Loan Program	Northwestern Electric Cooperative	Residential
	Red River Valley REA Heat Pump Program	Red River Valley REA	Residential

State	Program	Utility and/or program admin.	Sector
OR	Ashland Electric Utility—Residential Energy Efficiency Loan Program	Ashland Electric Utility	Residential
	Blachly-Lane Electric Cooperative Energy Efficiency Loan Program	Blachly-Lane Electric Cooperative	Residential
	Lane Electric Cooperative—Residential Energy Efficiency Loan Programs	Lane Electric Cooperative	Residential
	McMinnville Water & Light—Conservation Service Loan Program	McMinnville Water & Light	Residential
	Oregon On-Bill Repayment	Energy Trust of Oregon	Residential
	PGE Heat Pump On-Bill Repayment Program	PGE and Craft3	Residential
	Springfield Utility Board—Residential Energy Efficiency Loan Program	Springfield Utility Board	Residential
PA	Main Street Energy Efficiency Financing Program	Borough of Chambersburg Gas	Residential
	Valley Electric Cooperative ERC Loan Program	Valley Electric Cooperative	Residential, commercial, agricultural
SC	Aiken Electric Cooperative Help My House Program	Aiken Electric Cooperative	Residential
	Berkeley Electric Cooperative Home Advantage Loan	Berkeley Electric Cooperative	Residential
	Blue Ridge Electric Cooperative—Heat Pump Loan Program	Blue Ridge Electric Cooperative	Residential
	Broad River Electric Cooperative Heat Pump Program	Broad River Electric Cooperative	Residential
	Pee Dee Electric Cooperative—Energy-Efficient Home Improvement Loan Program	Pee Dee Electric Cooperative	Residential
	Santee Electric Cooperative Help My House Program	Santee Electric Cooperative	Residential
SD	Codington-Clark Electric Co-op Weatherization Loan	Codington-Clark Electric Co-op	Residential, rental
	Southeastern Electric Cooperative Electric Equipment Loan Program	Southeastern Electric Cooperative	Residential, commercial, industrial
TN	Nashville Electric Service Nashville Energy Works	Nashville Electric Service	Residential
	Bristol Tennessee Essential Services Energy Savings Loan Program	Bristol Tennessee Essential Services	Residential
	Ripley Power & Light Energy Conservation Loans	Ripley Power & Light	Residential
	Sequachee Valley Electric Cooperative Energy Right Heat Pump Finance Loan	Sequachee Valley Electric Cooperative	Residential
TX	Guadalupe Valley Electric Cooperative Conservation Plan 7	Guadalupe Valley Electric Cooperative	Residential, commercial

State	Program	Utility and/or program admin.	Sector
WA	Benton Rural Electric Cooperative Heat Pump Program	Benton Rural Electric Cooperative	Residential
	Grant PUD Weatherization and Heat Pump loan program	Grant PUD	Residential
	Okanogan PUD Residential Conservation Loan Program	Okanogan PUD	Residential
	On-Bill Repayment for Homeowners	Energy Trust of Oregon	Residential
	Seattle City Light and Craft3 On-Bill Home Energy Efficiency Loan	Seattle City Light	Residential
	Tacoma Public Utilities Zero Interest Loan	Tacoma Public Utilities	Residential, small multifamily, commercial
WI	Chippewa Valley Electric Cooperative ERC Loans	Chippewa Valley Electric Cooperative	Residential
WY	Powder River Energy Corporation Home Efficiency Loan Program	Powder River Energy Corporation	Residential