

Inclusive Financial Solutions Are Imperative to Meet 100% Targets

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ABSTRACT

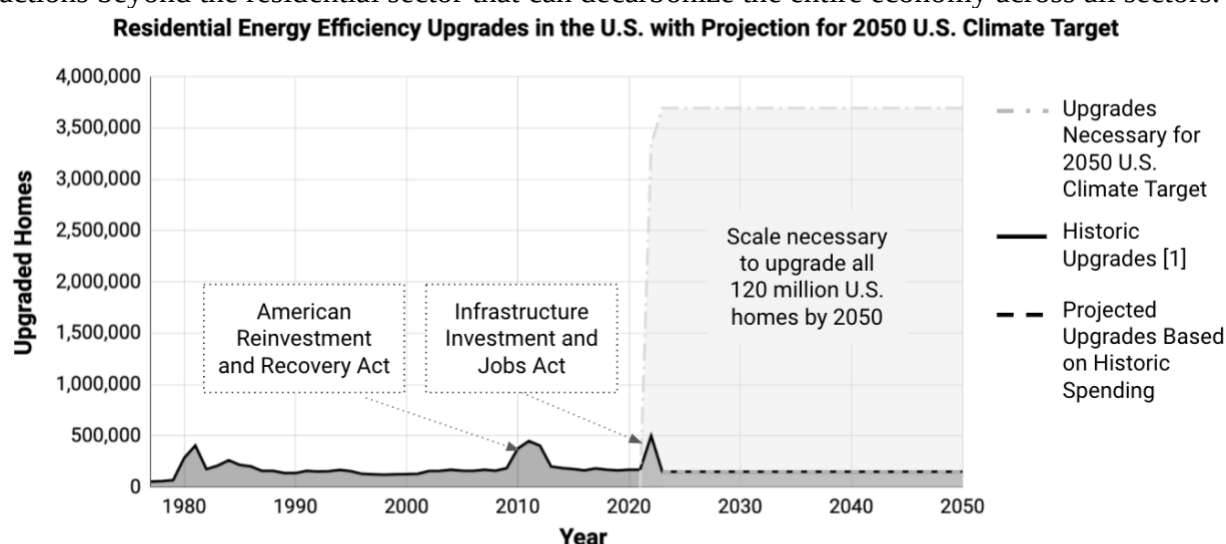
As more countries seek a path to 100% decarbonization targets, it is imperative to scale up building energy upgrades. The prevailing financial solutions for capitalizing these essential upgrades have not proven to be fiscally sustainable or scalable to approach those aims. Most U.S. households are systematically disqualified from participation in the clean energy economy by pervasive barriers like upfront cost or the split incentive between renters and landlords. As an attempted remedy, several states sought to popularize consumer loan products for energy upgrades. Four of the best performing state-backed consumer loan programs have reported reaching a maximum of 0.1% of the eligible households in any year, and among the beneficiaries, 90% had credit scores that were prime or better. Meanwhile, ten states have at least one utility offering Inclusive Utility Investment using Pay As You Save with strong consumer protections. They are harnessing a century-old social compact already in use by utilities across the globe to assure that a combination of funding and financing can reach every building regardless of income, credit score, or renter status of the occupant. California, Illinois, and New York have each concluded that access to financing is a significant barrier to efficiency, electrification and on-site solar upgrades necessary to reach state decarbonization targets, and now each have policy proceedings underway that could result in implementation of Inclusive Utility Investment by the largest utilities in the U.S. This paper explains how Inclusive Utility Investment policies are expanding access to and investment in building decarbonization.

Introduction

In 2021, the United States submitted to Parties to the United Nations Framework Convention on Climate Change (UNFCCC) a Nationally Determined Contribution (NDC) that “is expected to put the United States on a path to achieve net-zero emissions, economy-wide, by no later than 2050” (UNFCCC 2021). Achieving this outcome would require virtually every building in the country to be fossil free by 2050 or sooner, regardless of the income, credit score, or renter status of its occupants. Today, 20 states plus the District of Columbia and Puerto Rico, altogether representing half the population, have set 100% decarbonization or net-zero carbon emission targets consistent with the federally declared Nationally Determined Contribution (CESA 2021; Census 2021). However, there is a fundamental and persistent mismatch between the size of the financial capital required to meet 100% decarbonization targets and the political capital devoted in the United States to assure responsive financial commitments. As a result, the political viability and durability of U.S. pledges to mitigate carbon emissions depends critically on establishing pathways to rapidly capitalize building energy upgrades on equitable and inclusive terms that prioritize investment in low- and moderate-income communities.

In the U.S., upfront cost barriers to clean energy upgrades in buildings have systematically disqualified or discouraged a large portion of the population from undertaking building energy upgrades such as energy efficiency, electrification, and on-site solar and storage (Greenlining 2019; Nature 2019; ACEEE 2019). The clean energy divides produced by these pervasive barriers are antithetical to 100% clean energy targets, highlighting the policy

imperative to introduce and scale up inclusive financial solutions. The carbon emissions that have been beyond reach in the U.S. residential sector alone are 1,315 million metric tons per year, or 20% of U.S. annual greenhouse gas emissions (EPA 2020). Those households also encompass 100% of the voting population, which is consequential to the prospects for addressing pollution economy-wide. Figure 1 presents the historic pace and scale of federally funded or facilitated residential building energy upgrades, and it juxtaposes that past with a projection of the pace and scale of residential building energy upgrades that would be needed in the future to fulfill the U.S. pledge of action on climate change. But even that dramatic graph is an understatement of the challenge at hand. Inclusive financial solutions for massive, widespread capitalization of home energy upgrades are vital to sustain popular support for a host of policy actions beyond the residential sector that can decarbonize the entire economy across all sectors.



[1] The annual number of residential upgrades funded in the past is estimated by dividing the following funding sources, without subtracting overhead costs that do not directly contribute to upgrades, by the average dollars per upgrade reported for each program: U.S. Department of Energy's Weatherization Assistance Program (WAP); U.S. Department of Health and Human Services' Low-income Home Energy Assistance Program (LIHEAP), specifically 15% of state LIHEAP block grants to fund WAP activities; Utility ratepayer funds collected from ratepayers and transferred to a public benefit fund, WAP state agency, or program run by WAP local agencies; State taxpayer funds from fees or taxes; and U.S. Environmental Protection Agency's Home Performance with ENERGY STAR participant spending.

Figure 1. Annual sum of U.S. residential energy efficiency upgrades funded by federal and state taxpayer and utility ratepayers from 1977-2020, plotted with a projection to 2050 consistent with the U.S. Nationally Determined Contribution to the UNFCCC in 2021. Sources: LibertyHomes, U.S. Department of Energy, National Association for State Community Services Programs, and U.S. Environmental Protection Agency.

Linked Imperatives: Building Energy Upgrades and Energy Justice

After decades of energy efficiency resource development, energy efficiency upgrades are still the most cost-effective resource to develop for delivery of grid-connected energy services (LBNL 2021). Decades of reliance on consumer finance and utility rebate and incentive programs to drive energy efficiency adoption has resulted in inequitable and regressive distributions of investments (Ibid.; Reames, 2019). The distribution of those investments along with the distribution of household income has produced an imprint of inequity reflected in the map of energy burden, which shows that the national average energy burden for low-income households is 3 times that of non-low-income households (Reames, 2019; DOE 2021). The urgent policy imperative for advancing equity and inclusion in the clean energy economy is apparent in a

rising chorus of demand for increased public financial commitment to energy upgrades in disadvantaged communities (Justice 40 2022; Green New Deal 2019; THRIVE 2022; CLCPA 2019). For example, the American Jobs Plan (AJP) proposed by President Joe Biden in 2021 as a basis for the Build Back Better bill included unprecedented public spending on residential energy efficiency upgrades. As a candidate, Biden had proposed \$15.4 billion over a period of 4 years, and in the AJP, that figure was reduced to \$12 billion (White House 2021). At this level of funding, only 1.2% of the houses would have been reached through the Weatherization Assistance Program, but it did not pass. What remains is \$3.5 billion allocated for the Weatherization Assistance Program that passed as part of the Infrastructure Investment and Jobs Act, which is a bill with authorizations that are typically reconsidered every five years (Congress 2022). For comparison, leading scholars of energy justice had recommended a funding level for the program over the same time period that would have been more than 20 times higher just to reach eligible low-income households, those with income at or below 200% of the federal poverty line (RFF 2021).

In most utility energy efficiency programs, all customers within a sector are technically eligible to participate (e.g. residential, commercial, industrial), yet eligibility does not mean that all programs are accessible to all customers. Eligibility is a primary criterion with embedded disqualification criteria. For example, even where energy efficiency upgrades are cost effective, relatively high upfront costs compared to monthly savings presents a persistent barrier to participation. While commonly prescribed rebate programs reduce the net cost of energy upgrades to customers, the rebates are typically only useful to customers who have the ability to arrange for upfront payment of the full costs. Some customers can pay cash, others use a line of credit (e.g. credit card), and a small fraction arrange for a loan if they can (1) meet the credit qualifications and (2) agree to take on a long-term debt obligation. Most customers, however, do none of these - even in areas where the quality of the housing stock produces lucrative opportunities for energy efficiency upgrades (LBNL, 2021).

In addition to upfront cost barriers, the split incentives between renters and landlords also effectively exclude renters at any income level from accessing beneficial building energy upgrades. As a result, few landlords or tenants take advantage of programs that require an upfront investment or incurring new debt. The result is inefficient building stock with higher energy bills in rental properties, exacerbating economic insecurity because a majority of low- and moderate-income households in most housing markets are renters (HUD 2017).

Several U.S. states have introduced debt-based energy efficiency financing programs as a potential way to scale up building energy upgrades. Data for four of the largest and longest running loan programs has now been collected for a decade, showing that the maximum level of market penetration in any of those programs in any year was less than 0.1% of the households in the state (LBNL 2022). In addition, the same retrospective data analysis showed that 90% of the loan volume in these leading state-backed loan programs for residential energy efficiency upgrades went to households with credit ratings that were prime, super prime or beyond (Ibid). In this light, it appears that state-backed energy efficiency loan programs could inadvertently have been a regressive use of public funds, conveying benefits primarily to households that are well-qualified to be served by the banking industry.

The challenges that underserved customers face are so well known that their market segments are sometimes referred to as “hard to reach” or “difficult to serve” (DOE 2016). The central problem is not with the customers, however, but rather with the implicit and explicit program requirements that systematically disqualify or discourage them from participation.

Facing the data on anemic public spending for beneficial energy efficiency and building electrification compared to the need, there is a clear imperative for complementary financial solutions that are fiscally sustainable and scalable on terms that advance equity and inclusion.

Inclusive Utility Investment with Strong Consumer Protections

Inclusive Utility Investment, as recognized by the U.S. Environmental Protection Agency, refers to programs structured as utility investments in building efficiency upgrades on the customer's side of the meter. These programs include a voluntary tariff that provides utility cost recovery with a site-specific charge assigned to the customer's location rather than to the individual customer (EPA 2021). Inclusive Utility Investment programs do not require customers to prove that they are wealthy enough to qualify for credit or sufficiently low income to qualify for public assistance programs that are restricted to low-income households. This is especially important for reaching low- and moderate-income customers as well as customers who are risk-averse, debt constrained, living on fixed incomes, elderly (i.e. have limited life expectancy), and renters. Inclusive Utility Investment is a breakthrough in the field because it has two compounding effects: (1) it vastly expands the addressable market and (2) it yields higher participation among customers in market segments that are typically underserved by programs for which they have been paying for years. Since 2021, 23 utilities in 10 states in the U.S. have gained experience with Inclusive Utility Investment in site-specific energy efficiency upgrades, regardless of the income, credit, or renter status of the building occupant (EEI 2022). Altogether, these utilities have invested \$50 million, upgrading 6,000 buildings including single family, multi-family, commercial, and municipal and more than \$170 million is committed for upgrades in the next three years through Inclusive Utility Investment (Ferguson et al. 2022). The percentage of customers that accept an offer for an upgrade through Inclusive Utility Investment has ranged from 63% to 90% across all programs (EEI, 2022). To date, the annual market penetration of Inclusive Utility Investment programs, which have had virtually no marketing budgets, average 0.6% of households, six times that of the state-backed energy efficiency loan programs (Ibid).

How does Pay As You Save[®] work?

To date, every Inclusive Utility Investment program with strong consumer protections observed in the field has been based on the Pay As You Save system created by Energy Efficiency Institute, Inc. (Cillo and Lachman 1999). The Pay As You Save system enables both building owners and tenants (with permission from the owner) to purchase and install money-saving resource-efficient measures with no upfront payments and no debt obligation. Those who benefit from the efficiency savings pay for these upgrades through a tariffed charge on their utility bill, but only for as long as they occupy the location where the upgrades are installed. The annual charges are capped at a level that is significantly lower than the estimated annual savings from the upgrades and remain on the bill for that location until all costs are recovered, including the utility's cost of capital (EEI 2021). To offer a Pay As You Save program, a utility seeks one-time regulatory approval for an opt-in tariff to cover all cost-effective investments in energy efficiency upgrades or other distributed energy solutions on terms that are reasonable, non-discriminatory, and cost based. Once approved, customers interested in the opportunity can request an on-site energy assessment by a qualified energy assessor, who produces a list of cost-effective upgrades based on location-specific measurements, bill history, and engineering

calculations. To benefit from the utility's investment opportunity, a customer opts into a terms-of-service agreement that allows the utility to (1) invest in the energy upgrades and (2) recover its costs with a tariffed charge on the bill. The charge is capped at 80% of the estimated savings based on current rates and time-bound to 80% of the life of the upgrade (i.e., the 80% rule). Once the utility has recovered all of its costs for the upgrades at a location, including its cost of capital for the investment, the program services charges end, and the customer's bill decreases further. The customer at that location then gets all of the savings from the upgrades, which are estimated to last longer than the duration of payments, and thereafter, the upgrades belong to the building owner.

Pay As You Save has no eligibility requirement other than being a customer. Some utilities define additional eligibility requirements by referring to bill payment history (e.g., no more than two disconnections for non-payment in 12 months), while other utilities specifically prioritize customers with late payments or are otherwise at risk for disconnection as a way to assist with energy insecurity. Eligibility can be further constrained by placing requirements on the location (e.g., no structural repairs needed). The market will also constrain eligibility because not all locations will have energy efficiency upgrades that provide sufficient savings for a project to be deemed cost effective. The tariffed charge for cost recovery in the Pay As You Save system is capped at a fraction of the estimated savings (e.g. 80%) and the period for the cost recovery is capped at a fraction of the useful life of the upgrade (e.g. 80%). During the last 20% of the expected life of the project, 100% of the estimated savings goes to the customer at the upgraded location. Because this "80% rule" is based on current rates, the value of cash flow generated by energy savings increases with each rate increase. With the cost recovery limited to 80% of the estimated annual energy savings over 80% of the estimated useful life of the upgrades, the cost recovery is 64% of the total estimated savings over the full useful life of the upgrades. As a result, the ratio of the total estimated savings compared to the cost of the investment (SIR) will be at least 1.5, which provides better consumer protection than bill-neutral program design. If the energy audit finds that the estimated savings of an upgrade are sufficient to cover most but not all of an upgrade package, the customer has the option to make a co-payment to buy down the cost of the upgrade. If the customer does not want to make the co-payment, the customer can proceed with only the fully cost-effective upgrades for no cost.

Consideration of Successor Customers at Upgraded Locations

The utility's investment is tied to the location, so the obligation to participate in cost recovery does not follow the customer if that person moves away from the upgraded location. The tariffed charge for cost recovery then applies to the next customer at that location, who also enjoys lower bills from the upgrade. Because the terms of the tariff continue to apply automatically to the location until the utility's costs are recovered, successor customers are obligated to pay the charge for cost recovery on their utility bill, which is lower than it would have been without the upgrades. Before a utility will invest in upgrades at a site, the building owner must accept the obligation to notify future tenants or buyers of the utility's investment in upgrades and terms for cost recovery prior to lease or sale. If the customer is a renter and decides to relocate, the building owner simply has to notify prospective renters in writing before they sign their lease that they will be moving into an upgraded unit with lower energy consumption due to investments by the utility, and as a result, the utility bill will include a charge for cost recovery until all the costs are recovered. When the next customer starts utility service, the tariffed charge will appear on their bill – which will be lower than it would have been without the upgrade for the same level of usage. If the customer owns the building and seeks to sell it, the

customer must notify the prospective buyer of the utility's investment in upgrades prior to the sale.

The utility can also take steps to ensure that successor customers at sites where it invests understand the tariffed on-bill program benefits and obligations, beyond relying on the owner's obligation for disclosure. For example, when a successor customer opens a new account at a site where the utility has invested in upgrades, a flag in the utility's records prompts a letter to the new successor customer that describes the benefits and obligations of the Pay As You Save tariff that applies to the upgraded location until the utility's costs for the upgrades are recovered. The utility may also choose to facilitate disclosure by affixing notice of the program to places that any reasonable person might inspect before agreeing to rent or purchase the premises. Inclusive Utility Investments involve no assignment of a debt obligation, and therefore, Pay As You Save programs do not involve imposing a legal obligation on one person that then must be transferred to another person. As a result, the tariffed charge survives foreclosure proceedings, changes in tenancy, and can be floated through periods of vacancy. If some billing cycles are missed due to meter inactivity or non-payment, the implementing utility is authorized in the terms of the tariff to extend the duration of payments, but not beyond when the upgrades are functioning, in order to assure its cost recovery from customers benefiting from the savings at an upgraded location.

Financial security for cost recovery

Under the terms of the utility's tariff for site-specific upgrades, non-payment of cost recovery charges is subject to the same protocols that apply to other billed charges, which ultimately can result in disconnection of service. By contrast, non-payment of debt service on a loan results in default, which causes the utility to write down as a loss all future cost recovery charges for the upgrades at that location. Due to these differences, the financial impact of a loan default is much greater than non-payment for essential utility services provided under the terms of a tariff. Utilities making Inclusive Utility Investments with strong consumer protections based on the Pay As You Save system have reported writing off less than 0.1% of their investments and cost of capital, whereas consumer loan programs write down an average of 30 times that amount (Federal Reserve 2020).

Cash Flows in a Pay As You Save® Program

Figure 2 illustrates the cash flows in the Pay As You Save system, which has facilitated the investment of \$50 million to date and another \$170 million projected over the next few years (see Table 2, rows Illinois and Missouri). The utility can source capital in multiple ways, including the public or corporate bond markets, third party lenders, or its own balance sheet, which is supported with a mix of equity and debt. The earliest Pay As You Save programs drew on ratepayer funds with revenue designated for conservation program funding as a source of capital. Strong customer demand led to immediate cash shortages that suspended or delayed program investments until the next budget cycle made more funds available. The most recent programs approach capital sourcing as a business as usual activity for the utility, which is then also business as usual for the capital provider, whose risk exposure is indicated by the creditworthiness of the utility and the strength of its balance sheet.

Consistent with the terms of a Pay As You Save tariff, the utility is responsible for deploying capital for site-specific upgrades and recovering that capital with revenue generated by a charge on the bill for that location. The creditworthiness of the current or future customers at that site has no bearing on the investment, which is secured on terms of disconnection for non-payment that apply to all essential utility services. The utility tariff applies to both current and

future customers until all its costs are recovered, and to date, no utility has reported an instance of disconnection for non-payment of cost recovery for a Pay As You Save investment. If a site is permanently vacated or abandoned resulting in meter inactivity exceeding 24 months, the utility may charge-off the outstanding cost recovery using the same procedure that applies to non-payment for other essential utility services. Utilities are aware of the prevailing meter inactivity rate in their service area, and as the data above indicates, the charge-off rates reported by utilities with Pay As You Save programs are as good or better than the utility's mainline business.

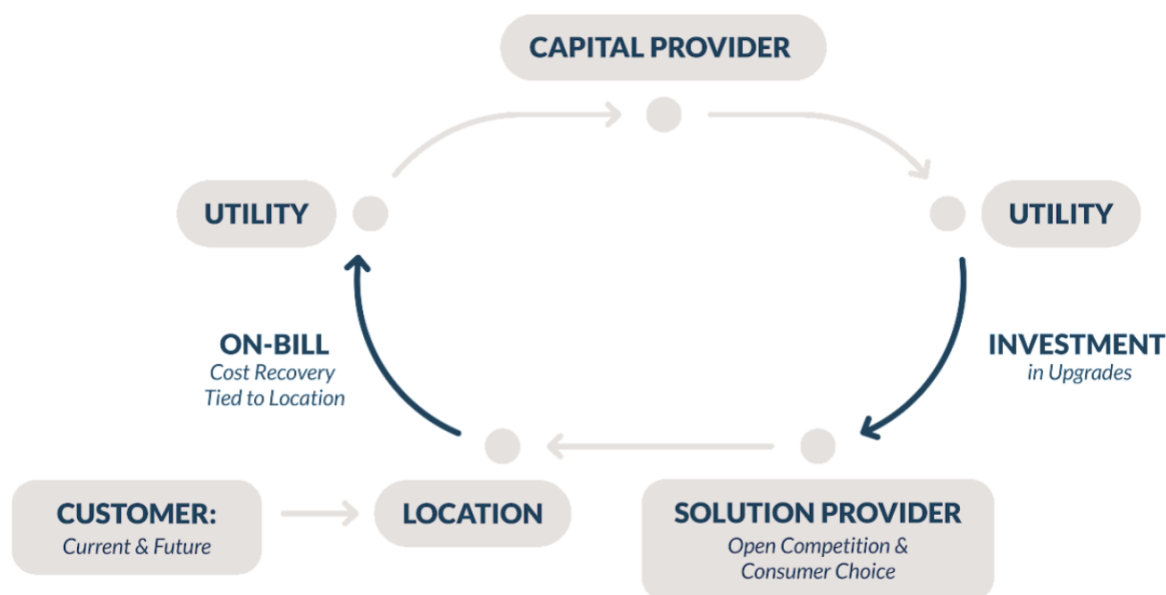


Figure 2. Flow of Capital in a typical program based on Pay As You Save®. Source: Clean Energy Works.

If Pay As You Save® is so effective, why hasn't the policy been more widely adopted until now?

In 2015, the Pay As You Save system for site-specific utility investments won a Finance for Resilience award at The Future of Energy Summit hosted by Bloomberg New Energy Finance (Bloomberg 2015). Since then, utility executives in 20 states have balked at adopting a solution that opens the throttle on efficiency gains that reduce the burden of high energy costs. In that same time span, Pay As You Save has won five more highly competitive awards related to finance and climate action, yet still, the pace of adoption has been far too slow. In informational interviews off the record, managers of for-profit utilities consistently pointed to incentive structures established by their regulators, explaining the fears of rapid development of energy efficiency and distributed energy resources are linked to the financial performance of their business and, in some cases, their personal compensation. Now that “electrify everything” is gaining appreciation as a climate action strategy, utility manager attitudes toward Inclusive Utility Investment in site-specific upgrades are changing because they are seeking solutions to overcome the upfront cost barrier and split incentives that hamper deployment of building decarbonization upgrades.

At the same time, dramatic and deadly spells of extreme weather in the past year (e.g. the Texas grid meltdown in a deep freeze) are underscoring the hazards of electrifying everything without also improving energy assurance. This is especially important in disadvantaged

communities where the distressed quality of housing stock makes residents even more vulnerable to conditions for hypothermia or heat stroke. For that reason, the slogans “electrify everything” and “green the grid” are dangerously incomplete without also calling for “upgrade every building” with integration of energy efficiency, on-site power, and storage at the grid-edge. This combination of site-specific energy upgrades can produce the virtual capacity of a power plant distributed across thousands of sites. For residents in centers for independent living that serve the physically disabled and residents in households with life-threatening vulnerabilities to power loss, those same virtual power plant capabilities can keep critical circuits up when the grid goes down. Some utilities have been hesitant to adopt Pay As You Save on the grounds that they “are not interested in being a financial institution that holds loans or liens on equipment on the customer’s side of the meter”, e.g., in and on customers’ homes (MO PSC 2019). Because lenders face compliance obligations with federal lending laws and the financial consequences of loan defaults among customers are far greater than missed payments for essential energy services, utility managers are sensibly loath to wade into consumer lending. In the Pay As You Save system, the utility does not hold a loan or lien but rather makes investments that are financially secured by the same protocol of disconnection for non-payment of services that apply to its other billed service charges. In short, Pay As You Save allows utilities to stick to what they do best: low-risk capital investment and cost recovery, rather than acting as a collection agency or qualifying and issuing loans like a bank.

Key Differences with Other Financing Approaches for Energy Upgrades

Tariffed terms for utility investment and cost recovery are different than bank terms for loaning money and collecting repayment, and those differences account for the striking difference in market response to the same energy efficiency upgrade opportunities. A Pay As You Save program participant does not take on a new debt obligation and, therefore, does not face the liability or the risk of disqualification due to underwriting criteria required in the banking sector. Like a loan, Pay As You Save allows for payment over time, but unlike a loan, the Pay As You Save obligation ends with the customer’s occupancy, at which point cost recovery continues with a successor customer. The Pay As You Save obligation also ends if the upgrade fails at no fault of the customer and it is not repaired.

Utility customers typically face a range of barriers to installing cost effective energy efficiency upgrades in their homes and businesses. To address barriers to financing, multiple solutions have been introduced in the field, including Pay As You Save® and on-bill loan programs like the Home Energy Lending Program (HELP) and Property Assessed Clean Energy (PACE). While these three models have been deployed to varying degrees of success in numerous markets throughout the United States, the differing designs of these programs have led to dramatically different results in the ability of customers to participate as well as differences in the ultimate benefits to all parties involved in these transactions. Of these three types of program designs, Pay As You Save is unique because it offers all utility customers the option to access cost effective energy upgrades using a proven model for investment and cost recovery that benefits both the utility and its customers. Furthermore, it is not mutually exclusive as an option in the marketplace with any other form of payment for the upfront cost of building energy upgrades, whether public funding or private financing. The differences between Pay As You Save and other financing programs for energy are captured in two categories – customer eligibility and customer experience. Table 1 shows these differences.

Table 1. Contrasting Customer Eligibility and Experience Across PAYS, Loans, and PACE

ATTRIBUTES	PAYS	Loans	PACE
CUSTOMER ELIGIBILITY			
Residential customers are eligible	X	X	X
Commercial customers are eligible	X	X	X
Renters are eligible	X		
No credit score check	X	[1]	
Eligibility includes all customers in a utility's service	X		
Utility uses bill payment history to confirm good standing	[1]	X	
CUSTOMER EXPERIENCE			
On-site energy assessment identifies cost-effective	X		
Customer chooses contractor for installation	X	X	X
No upfront customer cost	X	X	X
Estimated savings must exceed cost recovery charges over	X		
Immediate net savings to customer	X		
Payments end if upgrade fails and is not repaired	X		[2]
Customer signs a promissory note to accept a debt		X	X
Customer opts into a utility tariff tied to the location	X		
Customer agrees to disconnection for not paying utility bills	X		
Cost recovery is through a fixed charge on utility bill	X	X	
Customer agrees to a lien on the property			X
Cost recovery is through property tax bill			X
Participant's charges end when they leave the location if they have fulfilled their responsibilities, e.g., maintaining	X	[3]	[3,4]
Cost recovery runs with the location and remains in effect for subsequent customers at that site until cost recovery is	X		

[1] This attribute applies in some cases; [2] One PACE project developer markets a performance guarantee; [3] The loan obligation may be transferred to a successive property owner, provided they accept the debt obligation; [4] Because real estate negotiations may result in adjustment of the sale price based on the value of outstanding liens, the negotiations may ultimately obligate the seller to pay the outstanding balance on the investment.

Policy Precedent for Inclusive Utility Investments

Utility regulators and oversight boards and state governments in fourteen U.S. states have already approved or have directed development of Inclusive Utility Investment programs. Their efforts have produced a body of work validating the terms of the tariffs filed by implementing utilities meet the tenets of just, reasonable, and non-discriminatory. Table 2 presents the first

complete account of those cases in a peer-reviewed format with direct links to primary documentation (LibertyHomes 2021).

Table 2. Policy Precedents for Inclusive Utility Investment

State	Programs Enabled	Date Adopted	Approving Authority	Primary Documentation	Filed Tariffs
Arkansas	Ouachita Electric Co-op HELP PAYS®	2/8/2016	Commission decision	APSC Docket No. 15-106-TF Order No. 2 Ouachita	OECC Tariff Filed 2015
California	NA	12/16/2016	Commission decision	SB 350 Low-Income Barriers Study, Part A - Commission Final Report16-OIR-02 2016	NA
		9/4/2020		CPUC Proceeding Number R2008022 Order Instituted Rulemaking	
		3/5/2021		CPUC Rulemaking 20-08-022 Scoping Memo	
		11/16/21		CPUC Rulemaking 19-01-011 Amended Scoping Memo	
	Water Upgrades \$ave, Bay Area Regional Energy Network	1/19/2021	Oversight board decision	City of Sebastopol Resolution 6326-2021	City of Sebastopol Resolution 6326-2021
	Technology and Equipment for Clean Heating Initiative	3/27/20	Commission decision	Order Instituting Rulemaking Regarding Building Decarbonization	NA
Georgia	Income Qualified Tariff-Based Energy Efficiency Pilot, Georgia Power	4/28/2020	Commission decision	Consideration of Georgia Power’s Income Qualified Tariff Based Energy Efficiency Pilot Plan, filed on behalf of Georgia Interfaith Power & Light, Partnership for Southern Equity, and Southface Energy Institute in Docket Nos. 42310 and 42311	Income Qualified Tariff Based Energy Efficiency Pilot Filing
		5/7/2020		Order Approving the Income Qualified Tariff Based Energy Efficiency Pilot with Modifications	
		6/10/2020		Amended versions of its Plan for the IOTBEE-1 Tariff	
	SOUL, City of LaGrange	11/15/2021	Oversight board decision	SOUL Energy Efficiency (Sec. 20-1-12)	SOUL Energy Efficiency (Sec. 20-1-12)
Hawaii	Solar Water Heating Pay As You Save	6/26/2006	Statute	Act 240, S.B. No. 2957.	Solar Saver Pilot Rider
	Solar Saver, Hawaiian Electric	10/24/2006	Commission decision	HPUC Order 22974	
	Solar Saver, Hawaii Electric Light	6/29/2007	Commission decision	HPUC Order 23531	
	Solar Saver, Maui Electric	2/1/2013	Commission decision	HPUC Order 30974	

State	Programs Enabled	Date Adopted	Approving Authority	Primary Documentation	Filed Tariffs
Illinois	Equitable Energy Upgrades Program	9/15/2021	Statute	Climate and Equity Jobs Act (pp. 897-905)	NA
Kansas	How\$mart®, Midwest Energy	8/16/2007	Commission decision	KCC Order, Dockets No. 07-MDWG-784-TAR and 07-MDWE-788-TAR	How\$mart Energy Rider
		12/20/2007	Commission decision	KCC Order, Docket Nos. 07-MDWG-784-TAR and 07-MDWE-788-TAR	
Kentucky	How\$mart®KY, Big Sandy RECC	12/16/2010	Commission decision	KYPSC Case 2010-00089, Final Order	All KY Utility Tariffs (Look for Energy Retrofit Rider) Example: BSEC Energy Retrofit Rider Tariff (pp.30-49)
	How\$mart®KY, Grayson Electric Co-op				
	How\$mart®KY, Fleming-Mason Energy				
	How\$mart®KY, Jackson Energy Co-op	8/26/2013	Commission decision	Docket No. 2012-00484	
	How\$mart®KY, Farmers RECC				
	How\$mart®KY, Licking Valley RECC				
Minnesota	NA	9/1/2021	Commission decision	MPUC Docket No. G-008/M-21-377, Document ID 20219-177662-01	NA
Missouri	Evergy PAYS®	12/11/2019	Commission decision	MPSC Report and Order, File No. EO 2019-0132	NA
	Ameren PAYS®	8/5/2020	Commission decision	MPSC Order File No.EO-2018-0211	Ameren Tariff
	Ameren Gas PAYS®	11/05/2021	Commission decision	MPSC Order File No. GR-2021-0241	Ameren Gas Tariff
	Spire PAYS®	5/26/2021	Commission decision	MPSC File No. GO-2021-0126	Spire Tariff
	Evergy PAYS®	6/3/2021	Commission decision	MPSC File No. EO-2019-0132 and EO-2019-0133	Evergy MO Metro Tariff Evergy MO West Tariff
Liberty PAYS®	12/15/21	Commission decision	MPSC Order File No. EO-2022-0078	Liberty Tariff	
New Hampshire	Smart Start, Eversource	11/1/2000	Commission decision	NHPUC Order 23574	Eversource Smart Start Tariff (pp. 89-91)
		8/7/2001	Commission decision	NHPUC Order 23758	
		11/29/2001	Commission decision	NHPUC Order 23851	
	PAYS Pilot, New Hampshire Electric Co-op	12/30/2004	Commission decision	NHPUC Order 24417	NHEC SmartSTART (pp. 10-12)
New York	NA	4/1/2018	Govenor	New Efficiency	NA
North Carolina	NA	10/1/2019	Executive plan	NC Clean Energy Plan	NA

State	Programs Enabled	Date Adopted	Approving Authority	Primary Documentation	Filed Tariffs
	Duke Energy (in development)	7/20/2020	Commission decision	Docket No. E-7, Sub 1213, Sub 1214, Sub 1187	
	Upgrade to \$ave, Roanoke Electric	3/1/2015	Oversite board decision	NA	RIDER EECLP: Energy Efficiency & Conservation Loan Program (pp. 27)
Tennessee	U-Save Advantage, Appalachian Electric Cooperative	7/11/2019	Oversight board decision	Tariff accepted by supplier Tennessee Valley Authority	NA
Virginia	Rappahannock Electric Cooperative	4/20/2020	Oversight board decision	Virginia SB 754, On-Bill Tariff Program	Rappahannock On-Bill Tariff Rider

California, Illinois, and New York are three states that are trailing the others in Table 2 above. Their addressable market is much larger, as is the related scale of their decarbonization targets. Each is discussed briefly to illustrate the contemporary surge of interest and activity in the field. In California, one third of all households are recognized as low-income according to federal guidelines, and 70% of those households are renters (CEC 2016). In the state of New York, 2.3 million households qualify as low-income, and another 1.2 million as moderate income (NY DPS 2017). Both states are leaders in the field of clean energy and climate action, yet the vision of attaining their most ambitious targets requires much broader participation in the clean energy economy, especially among customers in market segments that are underserved by existing policies and programs. For context, the state of New York reported that “the primary energy efficiency and weatherization programs targeted at the low- and moderate-income market segment have reached only 12% of eligible households across building types and ownership status” in the past 12 years, achieving an annual average market penetration of 1% (NYSERDA 2018). To address the challenge, both California and New York initiated extensive stakeholder consultations in 2016 to explore and address barriers to participation in the clean energy economy in low-income communities. Policy panels in both states found that financing and access to capital was a significant barrier. Staff at the leading energy research agencies in each state (CEC and NYSERDA) solicited input from all types of solution providers. While report authors in both proceedings were familiar with inclusive utility investment through tariffed on-bill programs, they accepted all challenges to it and considered any alternative raised for attention.

California state law SB350 mandated the California Energy Commission (CEC) to study barriers to low-income customers participating in the clean energy economy. After months of extensive stakeholder consultation and multiple rounds of public comments and draft review, the CEC concluded, as expected, that financing is a barrier to low-income customers. In a report entitled “Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities,” the CEC advanced its top recommendation for addressing barriers to financing: “The CPUC should consider developing a tariffed on-bill pilot for investments in energy efficiency that targets low-income customers regardless of credit score or renter status, and that do not pass on a debt

obligation to the customer. Utilities could use the program to make energy upgrade investments and recover the cost through the bill, so long as the recovery charge is less than the estimated savings. The Energy Commission should encourage and provide technical assistance to publicly owned utilities (POUs) and other load-serving entities seeking to implement a tariffed on-bill pilot” (CEC 2016).

Meanwhile, the New York Public Service Commission chartered a Clean Energy Advisory Council (CEAC), whose “primary objective is to support innovation and collaboration leading to the development of the most impactful clean energy programs and to reduce cost and achieve scale for these resources, including an effective transition from current clean energy program offerings and on-going delivery thereafter.” The Council established a Low- and Moderate-Income Clean Energy Initiatives Working Group (LMI working group) co-chaired by key staff at NYSERDA and the Department of Public Service, home of the utility commission. The working group was composed of a specified variety of stakeholders, including affordable housing developers such as Enterprise Community Partners, utilities such as National Grid and ConEd, and community-based organizations such as PUSH Buffalo.

In support of the Council’s objectives, the LMI working group was tasked with investigating and evaluating alternatives to the current delivery of ratepayer funded clean energy services to LMI customers to improve the value for the customers served, as well as for the ratepayer funds being invested. The result of their work was delivered in a Report on Alternative Approaches to Providing Low and Moderate Income (LMI) Clean Energy Services (NY DPS 2017). Just six weeks after the CEC had concluded its yearlong Barriers Study, the NY CEAC LMI Working Group advanced its top recommendation on financing to the Council: “Demonstrate an inclusive finance solution in New York that overcomes the credit barriers faced by lower income and low FICO consumers, integrates 3rd party capital to create a finance model that is more sustainable than the current Good Jobs - Green New York (GJGNY) revolving loan fund, and possibly includes a guaranteed cost recovery mechanism.” In the following State of the State address, the Governor of New York promised to deliver a “comprehensive strategy” for achieving higher energy efficiency targets, and in fulfilling his promise, NYSERDA issued a white paper on Earth Day called “New Efficiency” (2018) in which it announced: “NYSERDA and DPS shall explore the development of a pilot Pay-As-You-Save (sic) tariff-based financing model with one or more utilities, as an instrument that expands the reach and effectiveness of the State’s energy efficiency initiatives while remaining consistent with the principles established in this document.”

In Illinois, the state government enacted the Climate Equity and Jobs Act, which includes a provision entitled the Equitable Energy Upgrade Program. It directs the state’s regulators of for-profit utilities to require the two largest investor-owned utilities to produce an inclusive financial solution for all cost-effective energy upgrades, and the law stipulates that the programs they propose must meet minimum requirements that assure strong consumer protections. The law also includes a deadline for action and a minimum scale of capital commitment in the first two years. These policy deliberations in Illinois, New York, and California are directly benefiting from the policy precedents in other states in the U.S. shown in Table 2.

Conclusion

In each of the places where Inclusive Utility Investment programs have been introduced, virtually every billpayer in a residential building with a sound structure (i.e. not in need of major repairs) has been eligible, and a majority of the people who receive an offer for a home upgrade

from their utility have accepted it. Some utilities have included commercial customers among those that are eligible as well. At this point, the risk is not that Inclusive Utility Investment with sound consumer protections won't work, but rather that it won't spread fast enough. In the past year, the pace of discussions with some utilities in the U.S. has accelerated, aided by a sweeping political imperative to advance equity and inclusion in the clean energy economy. In the last 12 months, utility commissions in six states in the U.S. have committed to investigating or implementing Inclusive Utility Investment programs. Authorizations for these investments are being considered or approved at the level of tens of millions of dollars in multiple U.S. states. This field-tested policy strategy for accelerating investment in building energy upgrades on more equitable terms is now positioned to fuel a multi-billion-dollar energy efficiency industry within the decade.

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