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Utility Tariff On-Bill Financing: Provisions and Precautions for Equitable Programs

by *Tom Stanton and Scott Sklar*

A growing number of utility companies and regulators are finding benefits from utility on-bill financing. This financing mechanism can enable customers to finance as much as 100 percent of the cost of qualifying energy efficiency (EE) and distributed energy resource (DER) investments through their local utility, often with no money paid at the time of project initiation. Customers pay for the improvements over time through monthly charges on their utility bills. Many cost-effective measures can be included in such programs, including building-envelope improvements, high-efficiency major appliances, and solar or solar plus storage systems. On-bill financing is one way to help utilities achieve legislative and/or regulatory resource goals or mandates, while requiring little, if any, increase in utility ratepayer-funded program expenditures.¹ It does so by leveraging spending from private sources, potentially including utility shareholders seeking investment opportunities. It also provides a way for customers who cannot take advantage of

traditional incentive programs to obtain benefits from EE and DER measures.

This *NRRI Insights* paper explores elements of on-bill financing program design and provides several examples of on-bill products and services. The objective of this paper is to explore the benefits and potential down-sides of on-bill financing and review the importance of various program elements so that regulators considering on-bill financing can best ensure that benefits will accrue to both participating and non-participating customers, as well as to participating utilities and vendors.

The Status of On-Bill Financing Nationwide

Currently, at least 110 utilities in 33 states offer on-bill financing, including 76 member-owned cooperatives, 11 publicly owned, and 29 investor-owned utilities.² These include three different types of programs: (1) on-bill financing (OBF), sometimes used generically to mean any of the three program types, but also used

1 Results attributed to non-utility-funded improvements are not always eligible to be counted towards meeting particular targets. See Kramer, Fadronch, et al., *Making it Count: Understanding the Value of Energy Efficiency Financing Programs Funded by Utility Customers*, Lawrence Berkeley National Laboratory, LBNL-1003944, 2015, <https://emp.lbl.gov/publications/making-it-count-understanding-value>.

2 See Environmental and Energy Study Institute, *Interactive Map of Utilities with On-Bill Financing Programs*, <https://www.eesi.org/obf/map>, retrieved 5 April 2019.

specifically to mean programs where the utility provides the financing and is the lender; (2) on-bill repayment (OBR), where a third party provides the capital and the utility collects payments and passes them through to the funder; and (3) utility tariffed on-bill (TOB) financing, where upgrades are undertaken, not as a loan to a customer, but as an added utility tariff associated with the meter at the address where the upgrades are installed.³ The policy and program evaluation work on this subject demonstrates that these programs may benefit consumers and utilities if they are properly developed and explained.⁴ At least 13 states have passed legislation enabling these programs, and similar programs are under consideration in several more states.⁵ On-bill financing programs can support a wide range of products and services that can pay for themselves through avoided utility charges over periods as long as 12 or more years. Measures financed this way could result in savings on utility bills, including electricity, heating fuel, water, and wastewater. Examples include:

- Whole-building EE and DER services for retrofits of existing and for enhancements in new buildings;
- Targeted high-value EE improvements such as new high-efficiency major appliances and heating, ventilating, and air conditioning (HVAC) equipment, including solar water heating; grid-integrated water heaters; ice-storage air conditioning; and heat pumps, including ground-coil loops for earth-coupled heat pumps.
- Indoor and outdoor lighting, both wired and wireless options, including street lights and security lights;

- Remote, off-grid equipment, such as livestock-watering and irrigation systems using solar pumps;
- Rooftop and community solar installations, including battery storage, with some options possibly eligible for either on- or off-grid installations;
- Battery storage and uninterruptible power supplies, including systems for customers using essential medical devices or with other critically important needs; and,
- Electric vehicle charging stations.

Important Program Design Elements

Sound regulatory approaches can create programs that meet the needs of participating consumers and produce value for the utility system and society as a whole. The design elements of a particular program will determine its ability to provide net benefits. Some design elements suggested by promoters of on-bill financing include provisions such as applying relevant program terms to successor customers if a property changes hands, holding participating vendors and contractors to high standards for consumer protection, and allowing disconnection for non-payment as a means of lowering financing costs.⁶ As shown in **Table 1**, several on-bill financing program design elements help to lower risks for participating customers, lenders, and utilities. Such provisions help ensure that total program benefits will exceed costs for participants, non-participants, the utility system, and society at large.

3 These distinctions are explained in reports from the American Council for an Energy Efficient Economy (<https://aceee.org/sector/state-policy/toolkit/on-bill-financing>) and the U.S. Department of Energy (https://betterbuildingsinitiative.energy.gov/sites/default/files/IB%20L-1%20EE%20Financing%20through%20On-Bill%20Tariffs_Final_0.pdf), both retrieved 3 September 2019. In this document, the term on-bill financing is used in the generic sense, except when discussing particular qualities of one of the other types. Note that the developers of the Pay-As-You-Save (PAYS®) program have used the term “tariffed on-bill” program for many years, to the exclusion of other programs that lack certain PAYS® elements. Personal communication with Nancy Brockway, October 17, 2019.

4 See sources for Table 1 and: Leventis, G., C. Kramer, and L.C. Schwartz, 2017, *Energy Efficiency Financing for Low- and Moderate-Income Households: Current State of the Market, Issues, and Opportunities*, Report for State & Local Energy Efficiency Action Network (SEE Action) Financing Solutions Working Group by Lawrence Berkeley National Laboratory, LBNL-2001045, <https://escholarship.org/uc/item/30p4j1b7>; and Heeter, Jenny S., Lori A. Bird, et al., 2018, *Design and Implementation of Community Solar Programs for Low- and Moderate-Income Customers*, National Renewable Energy Laboratory, NREL/TP-6A20-71652, doi 10.2172/1488510, both retrieved April 25, 2019.

For a current status report and forecast of U.S. electric utility customer-funded efficiency programming, see Goldman, Charles A., Sean Murphy, et al., 2018, *The Future of U.S. Electricity Efficiency Programs Funded by Utility Customers: Program Spending and Savings Projections to 2030*, Lawrence Berkeley National Laboratory, <https://escholarship.org/uc/item/6q31q148>, retrieved April 25, 2019.

5 ACEEE, <https://www.buildings.com/article-details/articleid/16495/title/new-financing-solutions-for-energy-retrofits>, and NCSL, <http://www.ncsl.org/research/energy/on-bill-financing-cost-free-energy-efficiency-improvements.aspx>, retrieved April 25, 2019.

6 To date, PAYS® programs have experienced non-payment rates from 0 percent to less than 0.5 percent (Hummel, Holmes and Harlan Lachman, 2018, “What is inclusive financing for energy efficiency, and why are some of the largest states in the country calling for it now?,” in *Proceedings 2018 ACEEE Summer Study on Energy Efficiency in Buildings*, Track 13: Energy Efficiency and Equity: Addressing the Underserved. <https://aceee.org/files/proceedings/2018/>). Observers have noted that participation seldom, if ever, increases a customer’s bill, and in some program designs the risk of disconnection for nonpayment is reduced to negligible levels. See e.g., In the Matter of: Joint Application of Big Sandy Rural Electric Cooperative Corporation, et al, *Order Approving an On-bill Financing Retrofit Rider*, Kentucky Public Service Commission Case No. 2010-00089, December 16, 2010.

**Table 1: Common Program Design Elements
Used in Successful Utility On-Bill Financing Programs**

Program design element or feature	Rationale
Implement on-bill financing as a customer tariff that treats the installed measures as utility investments assigned to the utility meter, to be repaid through a utility tariff charge.	Enables no-credit-check approvals and 100% financing, without the customers incurring debt, even low-income customers, and off-balance-sheet improvements for businesses and institutions.
Include disconnection for non-payment of on-bill financing charges, the same as for other utility tariff charges.	Reduces risk to the utility for customer non-payment of charges and for utility uncollectibles.
Apply the program seamlessly to new owners or tenants, if the original customer moves away.	Removes the risk that participants will not remain at their location long enough to receive the cost-saving benefits. Helps address split incentives between landlords and tenants.
Maintain high standards for vendors and contractors that protect consumers, including performance guarantees and warranties. Ensure that installed measures meet relevant codes and standards, and use trustworthy savings calculations (also called “investment grade”). Provide for dispute resolution to address problems.	Ensures cost savings and positive cash flow for participating customers. Ensures that any problems that do occur will be quickly and fairly resolved, thus placing with vendors and installers the risk of non-performance. Customers pay only for products and services that are working to reduce their utility bills.
Invite vendors and contractors to include all cost-effective measures that can reduce all utility bills, including electricity, heating fuel, and water and wastewater.	Expands opportunities for investors, vendors, and installers while enlarging customers’ cost-savings and simplifying customer participation through one-stop shopping.
Restrict installations to cost-effective measures.	Protects vulnerable customers from paying more than they save.
Reduce as much as practical the difficulty and complexity for participating customers.	Helps remove the barriers to consumer action by “getting to yes” as quickly and easily as possible.
Reduce customer acquisition costs for the pre-screened, qualified vendors and contractors.	Removes a major factor inhibiting action when customers understand they can trust participating vendors and contractors.
Integrate on-bill financing with other utility ratepayer and taxpayer funded EE and DER programs, so that the limited utility program funding leverages more private investment.	Maximizes the effectiveness of limited ratepayer and taxpayer funding and making it easier to meet or exceed legislative and regulatory mandates and targets.
Provide for program monitoring, evaluation, and reporting.	Ensures ongoing oversight to identify early any unforeseen problems, and take corrective actions as needed.

Sources:

Brown, Donal, Steve Sorrell, and Paula Kivimaa, 2019, “Worth the risk? An evaluation of alternative finance mechanisms for residential retrofit,” *Energy Policy* **128**, doi 10.1016/j.enpol.2018.12.033.

Cook, Jeffrey J., and Lori A. Bird, 2018, *Unlocking Solar for Low- and Moderate-Income Residents: A Matrix of Financing Options by Resident, Provider, and Housing Type*, National Renewable Energy Laboratory, Report No. NREL/TP-6A20-70477, doi 10.2172/1416133.

Deason, Jeff, 2017, *Comparative Evaluation of Financing Programs: Insights from California’s Experience*, Lawrence Berkeley Lab, Technical Brief, doi 10.2172/1393634.

Hummel, Holmes and Harlan Lachman, 2018, “What is inclusive financing for energy efficiency, and why are some of the largest states in the country calling for it now?,” in *Proceedings 2018 ACEEE Summer Study on Energy Efficiency in Buildings*, Track 13: Energy Efficiency and Equity: Addressing the Underserved. <https://aceee.org/files/proceedings/2018/>.

Mundaca, Luis, and Sarah Kloke, 2018, “On-Bill Financing Programs to Support Low-Carbon Energy Technologies: An Agent-Oriented Assessment,” *Review of Policy Research* **35**(4), doi 10.1111/ropr.12302.

Wilson, Eric J., Craig B. Christensen, et al., 2017, *Energy Efficiency Potential in the U.S. Single-Family Housing Stock*, National Renewable Energy Laboratory, NREL/TP-5500-68670, doi 10.2172/1414819.

Relevance for Participating and Non-Participating Consumers

On-bill financing has significant impacts for both participating and non-participating consumers. For non-participating consumers, well-designed on-bill financing programs can apply modest utility ratepayer investments, such as rebates or interest rate buy-downs, to leverage large amounts of private financing. By reducing consumption, the market equilibrium will occur at lower levels of demand, requiring less supply, and thereby helping to reduce the cost of supplying electricity. Commonly used benefit-cost tests can include estimates.

For participating customers, on-bill financing sometimes provides access to more capital, at more favorable terms, compared to other available financing options. On-bill programs can also be designed to ease the processes of applying for and obtaining financing, reducing hassles for consumers and requiring less effort compared to more traditional financing options. Comprehensive on-bill financing programs also include verifications of measure eligibility and code-of-conduct agreements for participating contractors and vendors, as well as trustworthy mechanisms for problem solving. Together, these features help assure customers that vendor performance promises will be achieved, including cost savings and environmental attributes. Some proponents argue that on-bill financing, in particular tariff on-bill financing, can overcome the split incentives between landlords and tenants. Proponents also note that some customers might not be able to participate in traditional incentive programs on any terms.

But at least some consumer advocates note that on-bill financing may also have risks, particularly for low-income customers.

Some consumer advocates have expressed concerns that program implementation might not meet the consumer protection needs that the program proponents had claimed would be included. Without adequate consumer protections to ensure good behavior on the part of participating vendors, on-bill financing could exacerbate problems that can plague any markets for small customer EE and DER. These concerns include ensuring that:

- Customers are sold only qualifying items that standardized modeling shows will reduce utility bills;

- Adequate quality control exists and there are readily available provisions to make corrections in case of premature product failure;
- Programs are supported through ongoing monitoring, evaluations, mid-course corrections, and continuous improvements; and,
- Low-income customers, senior citizens, and other potentially vulnerable groups will not be targeted by unscrupulous vendors nor be subjected to improper claims about performance and cost-effectiveness.⁷

Some advocates, both for consumers in general and some specifically for low-income or other vulnerable consumers, also worry that opening market opportunities for on-bill financing might also be seen as a justification for reducing or removing a utility's obligations for supporting EE and DER resource acquisition, and particularly utility support for programs serving low-income customers. Cost-effective EE and DER resources, verified through appropriate benefit-cost testing and acquired through other types of utility programs, they argue, will continue to lead to reduced system costs and can be wisely integrated with on-bill financing mechanisms.⁸ But, they do not want on-bill financing to displace other utility program dollars.

Relevance for Regulators and Utilities

There is growing evidence from program evaluations that utility on-bill financing can expand both the measures eligible for financing and the numbers and types of customers who can participate, by:

- Lowering the cost of capital, extending investment time horizons, and raising capital limits on EE and DER projects by providing capital explicitly and exclusively dedicated to achieving and maintaining long-term utility bill savings;
- Opening opportunities to serve customers for whom traditional energy project financing was previously difficult to obtain; and,
- Combining those factors to enlarge the opportunities for participating customers to achieve cost-effective savings while assisting regulators and regulated utilities in achieving energy efficiency and renewable energy goals at low total system costs.⁹

Of particular relevance to regulators, there is a funda-

7 Some programs have been designed specifically to mitigate these risks. See Hummel and Lachman, *ibid.* note 6.

8 See National Consumer Law Center, *On-Bill Financing* [Web page, retrieved September 25, 2019], <https://www.nclc.org/issues/on-bill-financing.html>.

9 See the sources listed in Table 1 and footnotes 3 through 6.

mental regulatory objective for utilities to provide service to customers at the lowest reasonable cost. Several states have already determined that this includes implementing cost-effective EE and DER resources. In addition, state policy goals and mandates are often leading to heightened interest in and performance standards for EE programs.¹⁰ At the same time, though, another fundamental regulatory objective is to limit new utility expenditures in supply-side resources, when practical, to curb upward pressure on utility rates. On-bill financing is one tool that can be used to help achieve all of those objectives.

Utilities can achieve solid financial gains from on-bill financing programs if shareholders are allowed to recover and earn a return on the expenditures necessary to enable these programs, for example, the costs associated with making the necessary changes to utility billing systems and for program administration. Plus, utility shareholders could have an incentive to make capital investments in cost-effective EE and DER resources. Those investments can benefit all ratepayers, both participating and non-participating. And, importantly, performance-based utility financial incentives could be offered based on measures of program success. The combination of all these incentives could result in utility managers and shareholders vigorously supporting the programs, including working on attracting and cultivating participating vendors and customers.

Rapidly implementing EE and DER resources may help reduce, or in some cases even eliminate, the need for traditional investments that would otherwise be needed for either replacing or adding new utility infrastructure. Rapid implementation can also reduce the risk of exposure to future environmental regulations, including potential restrictions on greenhouse gas emissions, and it can help achieve goals and objectives for reducing such emissions.

Utilities, regulators, and other interested parties could find extra value from on-bill financing programs in the form of customer goodwill and by producing useful

information about which neighborhoods are demonstrating the greatest interest in customer-sited EE and DER. Such locational data about EE and DER uptake could improve the accuracy of future utility planning. In some cases, geo-targeted marketing and expenditures are already proving capable of reducing, deferring, or displacing costs that would otherwise be needed for transmission or distribution system upgrades, or both. The terms “non-wires” or “market-based” solutions are often used to describe those opportunities.¹¹

On the other hand, utilities might have multiple concerns about on-bill financing and particularly about its implementation as a utility tariff. These include:

- The need for billing system upgrades to accommodate the accounting needs for individual customer expenditures and payments;
- Added complexity for utility operations and consumer services as utilities enter into what some observers say are essentially banking relationships with large numbers of customers;¹² and,
- The long-standing concern about the potential for rapid growth in EE and DER markets to result in the erosion of utility sales and profits.

Conclusions and Next Steps for Regulators Considering On-Bill Financing

Regulators considering on-bill financing programs will have to grapple with several potentially contentious issues. These include:

- Identifying the appropriate roles for utilities and third-party providers. Are there related services that can best be provided directly by utilities, or is it best that utilities provide only the platforms that enable third parties to provide the services?¹³
- Determining the appropriate role of the regulatory commissions in providing oversight for the products and services to be included in on-bill financing. What criteria will be required for products and services to

10 Several states endorse the idea of acquiring *all* cost-effective demand side resources (DSM). Many states are also working toward obtaining growing percentages of their electric power generation from renewable and other cleaner supplies. Plus many state and local governments are adopting goals to greatly reduce greenhouse gas emissions. See: American Council for an Energy Efficient Economy, *State and Local Energy Policy Database: Energy Efficiency as a Resource* [webpage], <https://database.aceee.org/state/energy-efficiency-resource>; North Carolina Clean Energy Technology Center, *Database of State Incentives for Renewables & Efficiency, Detailed Summary Maps* [webpage], <http://www.dsireusa.org/resources/detailed-summary-maps/>; and U.S. EPA, *Energy Resources for State, Local, and Tribal Governments* [Webpage], <https://www.epa.gov/statelocalenergy>, all retrieved May 7, 2019.

11 Northeast Energy Efficiency Partnerships, Inc., 2019, <https://neep.org/energy-efficiency-transmission-and-distribution-resource-using-geotargeting>, retrieved April 25, 2019.

12 In some utility tariff program designs, participants do not take on personal debt, which can avoid this potential concern while protecting consumers. See Hummel and Lachman, *op cit.* note 6.

13 Blansfield, Jonathan, Lisa Wood, et al., 2017, *Value-Added Electricity Services: New Roles for Utilities and Third-Party Providers*, Lawrence-Berkeley National Laboratory, LBNL-2001073, <https://emp.lbl.gov/publications/value-added-electricity-services-new>.

receive regulatory approval? What methods will be used to determine what products and services can be included in on-bill financing programs? Will multiple, diverse stakeholders have a role in those decisions?

- Including fuel-switching measures, such as natural gas to electric or electric to natural gas, or measures for converting from delivered heating fuels, like oil or propane, to natural gas or electricity. And, for measures that increase utility sales, should there be a requirement to show there will be benefits to all ratepayers and to society as a whole?
- Managing potential competition for on-bill financing offerings among competing utility companies (gas, electric, water, and wastewater) or between or among divisions within combined utilities.
- Ensuring access and participation opportunities for low- and moderate-income customers and other potentially difficult-to-reach groups.
- Allowing returns on investment, on the capital expenditures the utility makes for developing the capabilities needed to offer on-bill financing. Will the same or a different interest rate be earned on funds invested in qualifying measures, on behalf of the participating customers? Will the interest rate for participating customers will be determined using market competition among potential lenders?¹⁴ Or, will utilities be allowed an administratively determined rate of return, perhaps equal to the returns available for providing new generation resources, which would essentially put on-bill financing measures on par with traditional utility infrastructure choices?¹⁵
- Setting performance expectations and verifying through appropriate monitoring and evaluation that

on-bill financing programs are meeting them, thus warranting the authorized return on investment. Will there be opportunities for the participating utility company managers and shareholders to earn additional financial incentives, when the utility demonstrates exemplary performance in implementing its on-bill financing program?

Regulators will also have to consider whether sufficient incentives for utilities will be provided by authorized returns on utility investments combined with the other values that utilities can glean from on-bill financing programs.¹⁶ Even more adjustments could be needed to better align utility financial incentives with societal objectives. Regulatory proceedings in several states are already investigating whether performance-based incentives or even greater changes in utility business models and regulatory financial incentives might be required.¹⁷

A widely accepted premise in the history of utility regulation is that one important regulatory function is to simulate the effects of competition and market discipline, ensuring that even when there is no market, monopoly utilities will still behave as though they do face competition. One aspect of that guidepost is that regulators are responsible for ensuring that all regulated products and services reflect a balance between utility profits and customer protection, for both new and existing, participating and non-participating customers. Regulators today are also challenged by opportunities to allow innovations to emerge and take hold, in a century-old industry that has limited experience with embracing rapid change. Carefully designed on-bill financing programs are one available tool that can help support these multiple objectives.

14 Interest rates charged on existing U.S. cooperative (member-owned) utility on-bill financing programs presently range from 0 percent to 9 percent, with 30 coops charging less than 5 percent interest, 29 right at 5 percent, and 13 charging more than 5 percent (personal communications, Environmental and Energy Study Institute, April 2019).

15 TFC Utilities, in its *Million Rate Base Model*, proposes offering the opportunity to earn the same regulated rate of return on both supply- and demand-side investments, <http://www.tfcutilities.com/approach/the-million-rate-base-model/>, retrieved April 25, 2019.

16 Multiple economic impact studies indicate that investments in cost-effective EE and DER are associated with significant economic and employment multipliers that help support local economies. See, for example, Jenniches, Simon, "Assessing the regional economic impacts of renewable energy sources – A literature review," *Renewable and Sustainable Energy Reviews* **93**, 2018, 35-51, doi 10.1016/j.rser.2018.05.008; Rich, David, Olsen, Karen Holm, et al., 2018, *Sustainable Development Guidance: Guidance for assessing the environmental, social and economic impacts of policies and actions*, Report for Initiative for Climate Action Transparency, <https://climateactiontransparency.org/icat-guidance/sustainable-development/>; and Sheikh, Nasir J., Dundar F. Kocaoglu, and Loren Lutzenhiser, "Social and political impacts of renewable energy: Literature review," *Technological Forecasting and Social Change* **108** (2016), 102-110, doi: 10.1016/j.techfore.2016.04.022.

17 The North Carolina Clean Energy Technology Center, *50 States of Grid Modernization: 2018 Review and Q4 2018 Quarterly Report*, February 2019, pp. 28-29, reports at least 19 states have been engaged in activities considering combinations of changes to utility business models, performance-based ratemaking, and reexamining traditional rate designs. All of these kinds of changes are intended to change the incentives or disincentives that consumers and utilities face when considering investments in particular technologies. See <https://nccleantech.ncsu.edu/our-work/policy/the-50-states-reports/>. See also Deason, Jeff, 2017, *Comparative Evaluation of Financing Programs: Insights from California's Experience*, Lawrence Berkeley Lab, Technical Brief, doi 10.2172/1393634, p. 15.

Reaction to Tom Stanton and Scott Sklar’s Paper “Utility Tariff On-Bill Financing: Provisions and Precautions for Equitable Programs”

By John Howat and Olivia Wein

Tom Stanton and Scott Sklar’s paper on utility tariff on-bill financing (TOB) provides a broad introduction to the promise and risks of this form of energy improvements financing. We agree strongly with the paper’s emphasis on “sound regulatory approaches” and “program design elements to lower risks for participating customers, lenders, and utilities.” In that vein, we offer some thoughts on how to address Stanton and Sklar’s appropriate caution that “on-bill financing also has risks, particularly for low-income consumers.”

Low-income households struggle with energy insecurity and experience disconnections at a higher rate than non-low-income households. Keeping the lights on and indoor temperatures at safe and healthy levels are the primary functions of utility service, and there are programs and rules designed to help low-income consumers maintain those services. Financing programs for home energy improvements should not displace these protections or increase the risk of disconnection. This *Insights* paper highlights areas where strong program design is needed to shield vulnerable households from heightened risk of disconnection.

As an additional “Next Step for Regulators Considering On-Bill Financing” we recommend that consumer advocates, particularly those familiar with consumer financial protection laws, be brought into the process early on to help identify risks and potential solutions. What follows is a list of considerations that we recommend be added to any initial investigation into an OBF or TOB proposal.

Recommendations to Minimize Risk to Low-Income Consumers and Tenants

Avoid Displacement of Zero-Contribution Programming—Assuming consistency of measure selection and quality, programs requiring no upfront payment or post-installation repayment provide superior cash flow benefits. TOB or other financing should not be used to replace or supplant zero-contribution programs. Proposals to implement well-designed TOB are best-suited to service territories where there currently is no zero-contribution program offered to low-income utility customers.

Avoid Disconnection of Essential Utility Service—In some states, TOB proposals will need to address laws that prohibit the disconnection of utility service for

The transition to cleaner energy systems and usage in the United States is well underway. An equitable transition requires that low-income households, households of color, and other groups that are disproportionately cost-burdened gain access to the benefits of new technologies. It is also important that in the review of proposals to implement TOB and similar financing structures, policymakers, advocates, and other stakeholders examine and critique the roles of contractors, vendors, and private capital; identify risks for consumers; and implement program design features, protections, and controls that ensure and enhance home energy and financial security for all households.

Zero-Contribution Programs

Traditional low-income energy efficiency programs, such as the federal Weatherization Assistance Program (WAP) and the ratepayer-funded programs that operate in many states, require no upfront payment or post-installation repayment from participating low-income households. Funding for zero contribution, low-income energy efficiency and improvement programs comes from ratepayers or a governmental appropriation. These programs typically must be cost-effective — i.e., the value of energy savings must be greater than the cost of measures and program delivery.

The zero-contribution program design, as distinct from TOB, maximizes the short- and long-term cash flow benefits to participant households that are in greatest need of those benefits, eliminates the customer risk that net bill neutrality will not be achieved, and reduces the risk of customer disconnection of service due to non-payment of an energy improvement financing obligation.

non-utility charges on the bill. Even in states where there is no statutory prohibition, implementation of TOB should not result in service disconnection for non-payment of the energy improvement portion of a low-income utility customer’s bill. TOB implementation should include establishment of a loan loss reserve that could be tapped in the event of such non-payment.

Partial payments Should Preserve Service—Low-income households struggle with energy insecurity¹ and so it can be expected that partial payments will occur with TOB programs. Low-income consumer advocates believe that the utility’s primary job is to provide utility service and that public policy for

1 In 2015, 20 percent of U.S. households with annual income of less than \$20,000 reported keeping their home at an unhealthy temperature, and 23 percent reported receiving a utility disconnection notice (U.S. Energy Information Administration, 2015 Residential Energy Consumption Survey).

protect the health and safety of consumers is paramount. Thus, in the case of partial payment by a customer, the payment should first go toward the payment for the utility service.

Ensuring Net Bill Neutrality—Net bill neutrality or positivity should be guaranteed rather than used as an assumed or aspirational program marketing construct. TOB should include ongoing, verifiable savings monitoring throughout the obligation repayment period, and low-income participants should be held harmless in the event of under-performance of installed improvements. A hold-harmless guarantee should be backed up by establishing a reserve fund that may be drawn upon to reimburse participants for costs incurred due to under-performance. For low-income households, monthly net bill neutrality is critical and TOB may best be coupled with levelized billing, particularly where seasonal savings from installed measures are projected to fluctuate significantly. In the case of low-income households that are concerned primarily with short-term cash flow considerations, TOB or other energy improvement financing needs to generate monthly net bill neutrality (or positivity) to be financially beneficial from the customer's perspective.

Program Administration—TOB should be administered by an independent entity. Independent program administrators should be certified to conduct audits or assessments under standards that are, at a minimum, equivalent to those that apply to WAP. In addition, program administration should include thorough post-installation quality control and verification of installation quality. As indicated above, program administration should include verifiable savings monitoring throughout the obligation repayment period.

Prohibit Abusive Marketing—In no case should marketing of TOB be conducted by contractors, vendors, or others with financial interest in maximizing sales.

Rental Housing—TOB implementation and continuity of net bill neutrality assurance is particularly challenging in rental housing where there is a transfer of repayment obligation from one tenant to the next as occupancy turns over. Robust energy auditing, careful measure selection, ongoing monitoring of savings, and establishment of a reserve fund that may be tapped to hold participants harmless in the event of measure underperformance can be instrumental in assuring net bill neutrality of a tenant who elects to participate in a TOB program. However, a change in the number, lifestyle, and behaviors of household members can have bearing on energy savings from installed efficiency and other distributed energy resource measures. Thus, if TOB is to be implemented in rental housing, financed measures should be limited to those that are less sensitive to changes in occupancy, e.g., refrigerators.

Consumer Protection Laws—In consumer credit transactions, one of the most important issues is whether the creditor is subject to the claims and defenses that the consumer has against the seller or originator of the credit. The related creditors must be liable for the acts of the original seller. All TOB obligation and disclosure documents should, at a minimum, clearly identify and provide contact information for the independent program administrator, delineate measure performance assumptions, explain energy bill savings expectations, and provide the term of the obligation. In addition, the documents should clearly state that the utility customer with a TOB obligation has a right to dispute payment and identify procedures for initiating such a dispute.

On-bill financing can be an important tool in ensuring energy independence, but it must be approached carefully to ensure that the benefits are real. We appreciate Stanton and Sklar's introduction to the promises and risks of TOB and we appreciate the opportunity to react to their thoughtful paper with our low-income consumer perspective.

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About NRRI

The National Regulatory Research Institute (NRRI) was established in 1976 as the research arm of the National Association of Regulatory Utility Commissioners (NARUC). NRRI provides research, training, and technical support to State Public Utility Commissions. NRRI and NARUC are co-located in Washington, DC.

