



FLEXIBLE FINANCIAL CREDIT AGREEMENTS

## MODEL BRIEF

# Tariff On-Bill Financing (TOBF)

**Low- and moderate-income (LMI) households historically have been underrepresented in the solar photovoltaic (PV) market. Increasing LMI household participation may be facilitated through Flexible Financial Credit Agreements (FFCAs).**

An FFCA is an innovative financial or programmatic product that addresses underlying financial barriers for potential LMI solar customers, such as long-term contracting requirements, nontransferable solar subscriptions, credit score hurdles, seasonal income fluctuation, product or vendor skepticism, and limited mechanisms for multiplying or leveraging benefits.

This brief focuses on the Tariff On-Bill Financing (TOBF) model, in which utilities use a tariff to enable customers to pay back the cost of a solar panel without credit or income level conditions.

## Model Description

TOBF enables utilities to finance solar upgrades for LMI households without dealing with credit or income level issues. Utilities provide the capital for the solar asset, which the customers pay back through a tariff added to their electricity bill. Ideally, the reduced electricity usage provided by solar generation leads to a lower utility bill, even with the additional tariff.

Because customers repay the investment through a tariff, it is not technically a loan. This means that customers' credit and income levels do not need to be accounted for, as long as the investment provides savings. This enables greater access to solar for LMI households because they are more likely to have issues accessing credit, allowing the model to overcome a key barrier.

Given the focus on tariffs, this model will require utility implementation (although regulatory bodies typically must support these programs because they approve tariff changes in most cases). In the case of on-site solar (which represents the vast majority of residential- and commercial-owned PV

systems), the solar investment is tied to the meter of the physical property for the purpose of financial and legal arrangements, so payment obligations are transferable between customers if the property is sold. Furthermore, regulators must agree to relevant financial and legal arrangements with the utility based on the specific designs of the TOBF ([Review of Policy Research](#)).

Overall, this model can serve LMI households because it allows them access to solar without dealing with credit and income level issues, which serve as common barriers to LMI solar access. That said, the use of TOBF for LMI households, in particular, should be monitored by some entity to guarantee that these investments make economic sense and are not burdensome.

## Similar Examples

Most implementations of the TOBF model have focused on energy efficiency upgrades, because these upgrades often have lower overhead costs than solar assets ([Better Buildings](#)). Pay As You Save (PAYS) is a trademarked program utilities can pay for that serves as a framework for TOBF implementation ([Clean Energy Works](#)); all successful TOBF programs have either used the PAYS model directly or have utilized a PAYS-licensed operator to implement their programs ([Southeast Energy Efficiency Alliance](#)). Although PAYS mostly focuses on energy efficiency, some utilities (mostly rural cooperatives) offer TOBF for solar assets as well. Currently, at least 110 utilities in 33 states offer on-bill financing (which includes TOBF), including 76 member-owned cooperatives, 11 publicly owned utilities, and 29 investor-owned utilities ([National Association of Regulatory Utility Commissioners \[NARUC\]](#)).

As one example, Hawaii Electric Companies has a TOBF program that enables LMI customers to pay back the cost of installing solar PV, solar water heaters, and other eligible clean energy upgrades with no upfront costs. The program is funded by Hawaii's green bank, and the customer repayments are tied to the property, not the individual, enabling renter flexibility ([Environmental and Energy Study Institute](#)).

Another example is Roanoke Electric Cooperative's program, which utilizes the PAYS model to implement TOBF. The program has increased inclusive finance and limits the administrative burdens of the cooperative. It is quite popular and has a waiting list for participants ([Low-Income Solar Policy Guide](#)).

Finally, Grand Valley Power, an electric cooperative, utilizes the TOBF model to finance community solar. Participants can sign up for 4-year subscriptions with no upfront costs, and they pay a tariff of 2 cents per kWh to cover the program costs in exchange for bill credits. However, the project costs were largely covered by grants ([Low-Income Solar Policy Guide](#)).

## FFCA Rubric

The National Renewable Energy Laboratory (NREL) designed an FFCA evaluation rubric composed of four high-level metrics—locational flexibility, financial flexibility and stability, attractiveness, and impact—with fifteen sub-metrics. Stakeholders can evaluate FFCA concepts by rating the sub-metrics, which have maximum scores of 5 or 10, depending on the sub-metric's level of importance. Total scores have a maximum value of 100. These scores are subjective and depend on individual FFCA program design; however, they provide a general framework for judging the merit of a program. Below, the authors rate the *TOBF* concept.

### Portable

●●●●●●●●●● (1/10)

Solar asset is tied to the property (through the specific meter), so it is not portable

### Universal

●●●●●●●●●● (10/10)

Utilities can likely apply this model anywhere, but state legislative or regulatory clarity may ease adoption

### Applicable

●●●●●● (2.5/5)

Most applications are for on-site solar serving single-family homes; going off-site or serving multi-family buildings requires more careful program design

### Transferable

●●●●●●●●●● (10/10)

Benefits can transfer to whomever owns property

### Investable

●●●●●● (5/5)

Could range from 5–10; if the customer is the owner, they will own the asset in the end, but this is not the case for renters. Customers can also benefit from tax breaks being passed through from utilities

### Accessible

●●●●●● (2.5/5)

Renters will not benefit from owning the asset, but no income or credit verification required for access

### Secure/Transparent

●●●●● (5/5)

Utilizes existing utility processes, which are usually very strong

### Equitable/Desirable

●●●●●●●●●● (5/10)

Could range from 5–10; depends on program design and implementation

### Strengthens Community

●●●●● (0.5/5)

Could range from 0.5–2.5; community engagement is not inherent in the model and would require more complex program design

### Leverages Partners

●●●●● (0.5/5)

Could leverage partners in enrollment or outreach, but this is not built into the model

### Mitigates Risk

●●●●● (5/5)

Protects the credit of both the utility and the customer

### Provides Financial Benefits to LMI

●●●●●●●●●● (10/10)

LMI households can benefit from lower costs of capital, tax credits that lower tariff rates, benefits of ownership, and behind-the-meter solar production

### Provides Non-Energy Benefits

●●●●● (2.5/5)

There are no non-energy benefits inherent to retiring arrears, but some benefits could be obtained based on the structure of the program (ownership/financial literacy, displacing fossil fuels)

### Impacts Grid Flexibility/Stability

●●●●● (0.5/5)

Could range from 0.5–2.5; the model could enable energy storage and distributed energy resources grid benefits, but this is not inherent to the model, and it could create competing goals

### Scalable

●●●●● (2.5/5)

This model is scalable, but requires regulatory approval to go forward

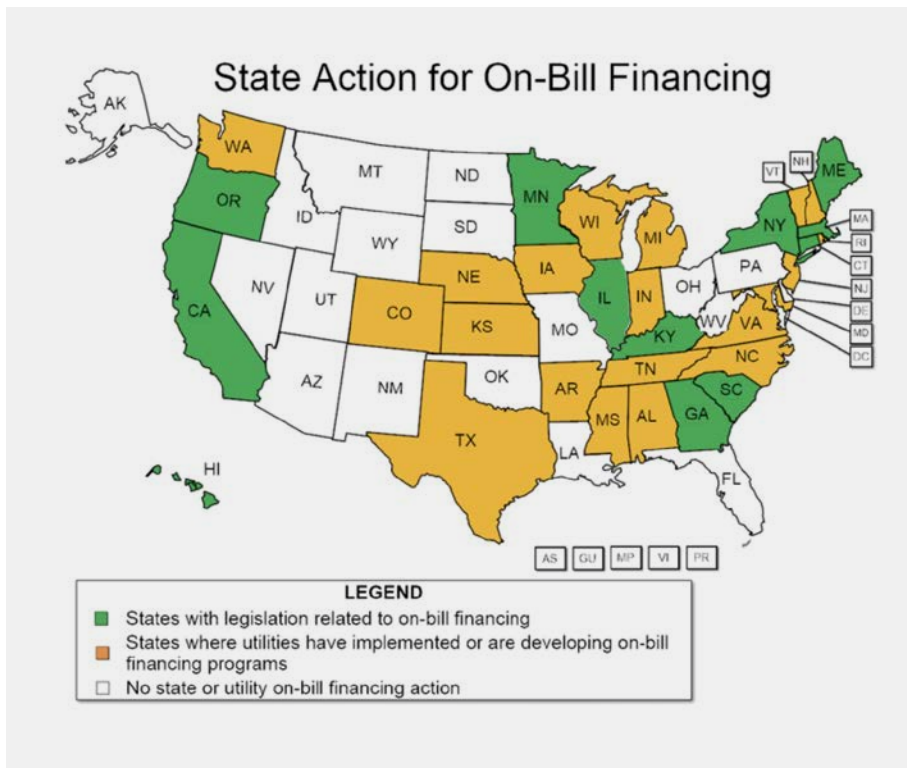
## Discussion

There are several benefits to utilizing TOBF as a vehicle for directing solar benefits to LMI households: the model can be applied anywhere; benefits can transfer even if property ownership/tenancy changes; and owners can benefit from asset ownership without the upfront cost. Conversely, the benefits are not portable if one leaves the property.

TOBF as a whole could be implemented across the country. However, state legislative and/or regulatory clarity can help ease program design and implementation. Figure 1 breaks down the legislative environments surrounding TOBF by state. Furthermore, the structure for TOBF is not very complex and has been implemented widely across the United States. Utilities and regulators are the key partners, but consumer protection groups and LMI advocacy/support groups may also play a role in improving program design and implementation. There are certain program design considerations (discussed below) that are particularly important when utilities and regulators are considering how to use TOBF to help them achieve their goals. These include accounting for utility type, renter-owner considerations, and other specific program design issues.

As mentioned above, most utilities that implement TOBF are publicly owned, and they have focused on energy efficiency measures when using TOBF because of the potential difficulties of integrating solar into their grid operations. IOUs do not participate as much, because they are more likely to perceive TOBF as a risky undertaking that may hurt their credit. At the same time, regulators are also less likely to trust IOUs to implement the TOBF model due to concerns around consumer protection. As such, careful (and differentiated) messaging can better show potential stakeholders the widespread benefits of this model.

In terms of renter-owner considerations, because TOBF ties payments to a specific property, renters no longer need to pay the tariff if they move ([American Council for an Energy-Efficient Economy](#)). However, one potential downside is that renters cannot benefit from owning the solar panel after they have made all payments. Thus, utilities should tread carefully when designing TOBF programs to ensure that all impacts on renters or owners are intentional and fair. This means that TOBF programs might vary significantly depending on whether the customers are mostly in single-family homes or multi-family buildings. Overall, TOBF does relatively well resolving the renter-owner split-incentive challenge; the renter receives net savings on their energy bill, and the owner doesn't have to cover the cost of the solar installation.



**Figure 1:** Legislative environment for on-bill financing by state (National Conference of State Legislatures)

Finally, both utilities and regulators should consider other specific program design considerations. Utilities must ensure that the tariff can cover the investment while still creating savings for customers, and in terms of program implementation, they should carefully consider the duration and size of the program, how to perform customer outreach, and any potential software upgrades their systems may require (NARUC). Regulators must ensure that LMI households

can actually access the benefits of the program, and they should set performance expectations to ensure that utilities can still earn an adequate rate of return (NARUC). They should also consider the possible role of third-party service providers, which may increase program performance (NARUC).

## Next Steps

This model's most important impact is its ability to help LMI communities access solar without credit or income verification. In addition, it can operate within existing regulatory and utility structures. Therefore, the next step is to bring utilities and regulators on board to better understand how program implementation at a larger scale can support LMI solar access, and how that might differ from its current focus on energy efficiency upgrades.

Authored by  
**Kevin Wu**  
NREL

## Full Overview of FFCA Products

[www.nrel.gov/solar/market-research-analysis/flexible-financial-credit-agreements.html](http://www.nrel.gov/solar/market-research-analysis/flexible-financial-credit-agreements.html)

