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**On-Bill Financing of Energy Efficiency:
Not a Good Residential Choice**

NOTE TO READERS

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**While On-Bill Financing of Energy
Efficiency May Have its Place, Shortcomings
Make its Use for Residential
Customers Inappropriate**

Fisher, Sheehan and Colton (FSC) was asked to assess the reasonableness of developing an On Bill Repayment (hereafter referred to as On-Bill Financing, or OBF)¹ regime for residential rate-payers of Philadelphia Gas Works (PGW). The review concluded that, irrespective of the extent to which, if at all, PGW seeks to develop an OBF program for non-residential customers, OBF is inappropriate for residential ratepayers.

The Inability to Achieve Bill Neutrality.

The first factor making on-bill financing inappropriate for residential customers involves its inability to achieve bill neutrality. The way OBF is sold to residential customers is through the promise of "bill neutrality." Bill neutrality means that the dollar amount by which the customer's bill will increase due to the need to repay the financed amount for usage reduction will be more than offset by the dollar amount by which the customer's bill will decrease because of the usage reduction associated with the energy efficiency investment. On-bill repayment assumes the ability of the residential customer to use the bill reduction generated by the efficiency investment to pay the bill increase associated with the financed amount.

The problem with this is that it is impossible to ensure that bills will be reduced to the extent necessary to more than offset the increased OBF

¹ This discussion will not distinguish between On-Bill Financing ("OBF"), On-Bill Repayment ("OBR"), Tariff-Implemented Programs ("TIP"), etc. The discussion below applies equally to each of these approaches.

payment. Estimating usage reduction is an inexact exercise with which to begin. Even if the housing unit's condition is exactly as it is expected to be, and even if efficiency investments work exactly as they are expected to work, the estimation process is just that, an estimate. Actual usage reduction, however, and thus actual bill reductions, may be more or less than what is estimated on the front-end.

In Pennsylvania, PGW acknowledged that energy consumption may increase even after the installation of energy efficiency measures. As PGW observed: "It is also important to recall that a building's energy usage may increase (or decrease) due to changes that have nothing to do with efficiency, such as changes in occupancy or family composition, or addition of new appliances (e.g., gas ranges, gas dryers). The efficiency treatment may have reduced usage compared to what it would have been with changes in usage but without the efficiency measure."

As this PGW statement acknowledges, there are innumerable extraneous factors, not related to the efficiency investment, that can and will affect whether a customer's energy efficiency investment will yield bill neutrality.

The factors that will impede achieving bill neutrality are frequently associated with household characteristics. Household factors such as household composition, household behavior and household appliances will all affect whether the household experiences bill neutrality as a result of any given energy efficiency investment. These factors, however, are not limited to household-related factors. Bill neutrality is related just as much, if not more so, to external factors such as natural gas prices. Natural gas prices in Pennsylvania, for example, were 28% lower in 2014 than they were in 2008. Each year they decreased, it would have been more difficult to justify an efficiency investment on the basis of bill neutrality.

Even without these decreasing gas prices, it would be difficult to achieve bill neutrality for

efficiency investments. PGW's 2011 Low-Income Usage Reduction Program (LIURP) Evaluation reported that the total program cost for a complete treatment under LIURP reached \$3,762. Escalated to 2015 dollars (using the BLS inflation calculator), these costs would reach roughly \$4,000. Assuming a repayment period of 10 years (120 months), and an annual interest rate of six percent (6%/year; 0.5%/month), the amount needed to service that debt (not including any fees) would be \$44.41/month. The average residential PGW bill, however, is just \$1,013 per year (2013), or \$84 per month. The debt service, in other words, would be 53% of the average bill. In contrast, average LIURP usage reductions (not bill reductions) reached 15.6%. To achieve greater reductions, of course, would drive the program cost even higher.

Even if one were to increase the initial bill by 25% (to \$1,266 per year), the savings needed to offset the on-bill repayment amount would be more than 40% of the monthly bill ($\$1,266 / 12 = \105.52 ; $\$44.41 / \$105.52 = 0.421$). If one were to increase the initial bill by 50% (to \$1,519/year), the bill reduction needed to offset the on-bill repayment amount would be 35% of the annual bill.

Similarly, even if one were to reduce the interest rate to 0%,² the bill reduction needed to offset the on-bill repayment amount would be: (1) 39% of an average bill; (2) 32% of a bill 25% higher than average; and (3) more than 26% of a bill 50% higher than average.

On-Bill Financing and Other Energy Efficiency Policy Objectives

On-bill financing may be in conflict with public policy seeking to achieve deep retrofits through residential efficiency investments. Deep retrofits generate greater savings. They do not, however, generate sufficient savings upon which to

² This would, of course, increase the cost of the program as a DSM program, since the interest rate subsidy would need to be provided by the program.

base a finding of bill neutrality. The deeper (and more expensive) the retrofit, the larger the savings that must be realized by the consumer in order to have savings “pay” for the efficiency investment.

Moreover, deep retrofits involve timing problem for purposes of justifying OBF on the basis of bill neutrality. Deep retrofits involve efficiency investments that involve a longer-term payback period. Since on-bill repayment obligations, however, are to be paid from the savings generated by the efficiency measure, the repayment term should reflect the life of the efficiency measure. If the on-bill repayment term is shorter than the life of the efficiency measure, it is less possible for the savings to offset the financing costs. Given this, the fact that on-bill repayment will not involve repayment terms that reflect the longer measure lives of deep retrofits,³ it is not possible for OBF to yield bill neutrality. Indeed, OBF is generally associated with efficiency measures with shorter-term lives. Implementing such a regime is at direct odds with the direction of residential DSM investment initiatives seeking deep retrofits.

Finally, the longer repayment terms associated with deep retrofits are at odds with OBF in terms of the risks that are imposed on the financier. Because of these increased risks, the financing for such investments will need to involve either higher financing costs (making it even *more* difficult to justify the investment based on bill neutrality) or more stringent creditworthiness requirements (or both). Higher risks arise both because longer repayment terms impose a greater risk of nonpayment at some time during that repayment period, and because the longer a repayment term extends, the greater the risk that a change will occur in the occupants of the unit that has been treated.

³ The entire process of reasonably matching OBF repayment periods with the measure lives of efficiency investments becomes extraordinarily more complicated with deep retrofits since deep retrofits will involve efficiency measure that have *different* life spans.

Finally, the need to achieve bill neutrality is at direct odds with the Pennsylvania policy that utilities should begin to modestly expand the health and safety repairs to be included as part of the efficiency treatment of a residential home. Whether the additional required home investment involves an upgrade to home wiring, addressing the presence of asbestos, or making minor home repairs, health and safety expenditures have the impact of expanding the cost of the efficiency project without expanding the level of usage reduction (and thus the level of bill reduction) that results from the treatment.

With the cost of the program increased, without any increase in off-setting usage (and thus bill) reductions, the ability to achieve bill neutrality for the OBF repayment will be further impeded. An inherent tension exists between the existing Pennsylvania policy to expand the availability of energy efficiency investments by expanding the inclusion of health and safety repairs within the scope of the efficiency program and the need to keep OBF repayments bill neutral.

On-Bill Financing and Residential Mobility.

An on-bill repayment regime is particularly problematic for residential units for whom occupancy changes before the end of the OBF repayment term is completed. On one level, there are legal consumer protection issues of what notice must be provided to the new occupant of a premise which is bound by an OBF obligation and when that notice be provided. On another level, there are legal issues involved with what consumer protection remedies lie with what parties (e.g., do claims for misrepresentation or other mis- or malfeasance survive a change in occupancy?).

Even larger issues appertain to the process of creditworthiness which appertains to a change in occupancy. Since an OBF regime is, at its very heart, a financing mechanism, one of the fundamental elements of the process is the determination of creditworthiness. When occupancy of a unit changes, however, the terms of the financ-

ing may become out-of-date from either or both the perspective of the occupant and the financier. The new occupant may seek different financing terms (either in terms of the finance charge imposed or in terms of the length of the repayment obligation). Similarly, the financier may find that the new occupant poses substantially different creditworthiness risks. As a result, the financier may wish different lending terms as well. The different lending terms, however, from either perspective, may change the entire cost-effectiveness finding of an efficiency investment that cannot be “undone.”

Changes in occupancy also change household characteristics that will affect whether the underlying finding of bill neutrality remains reasonable. If bill neutrality cannot be achieved by the new occupant, and if bill neutrality was an essential component of the original financing arrangement, changes in the terms of the repayment would be needed. A new occupant of the housing unit may have different usage for any number of very legitimate reasons that would have been foreseeable at the time the OBF agreement was entered into with the utility (and the financier). Particularly if bills increase, customers will not see the bill neutrality which formed the foundation of the OBF financing bargain.

Inherent Conflicts between Financier Interests and Customer Needs

When an OBF program is directed toward residential customers, there are significant inherent conflicts between the interests of the residential customer-participants and the interests of the entity providing the financing. The first conflict involves the need for a high degree of standardization required by financiers. The finance industry no longer involves a financial investor lending money and making its money off of the finance charge imposed on the borrower.

Instead, in today’s world, the financial institution seeks to generate a substantial volume of lending traffic in order to allow the institution to

bundle its portfolio of loans to sell on the secondary market. That process of bundling loans for sale, however, requires a high degree of loan standardization.

This need for standardization is at odds with a residential efficiency program. Instead of standardization, the needs of residential customers require substantive inquiries into, and individual determinations of, creditworthiness. Not only will this substantive creditworthiness determination affect whether a wide range of customers may participate in a residential financing program at all, but the finding of creditworthiness will affect the level of the finance charge that is imposed. Residential customers will potentially want substantial variations in the term (in months) of the finance agreement. The term (in months) will also need to vary based on the need to achieve bill neutrality.

Finally, it will be impossible to achieve a high degree of standardization when different residential customers have different packages of efficiency measures that will be appropriate for their individual residences. The appropriate mix of measures for any individual home should be derived from an energy audit of that home and a determination of what is both necessary and cost-effective for that home. Customers may also choose not to finance the entire range of cost-effective efficiency measures, even if they choose to implement the full range of measures.

The desire to bundle and sell energy efficiency financing transactions is not limited to any particular utility service territory. Standardization would need to occur on a basis extending even beyond the program portfolio of any given individual utility. In order to participate in a secondary market, financiers will want to standardize their offerings not only between PGW residential customers, but on a multi-utility jurisdiction and on a multi-state basis. Each step of this standardization will move the transaction one more step further away from the ability of a residential customer, even a sophisticated shopper in the financial market, from being able to influence on an individualized basis.

Financiers will finally want to bundle their energy efficiency financing with other products to sell on the secondary market. In the realm of consumer loans, energy efficiency loans represent a very small loan. Accordingly, it is reasonable to expect that financiers will seek to cross-sell other financial products in conjunction with their efficiency financing. This cross-selling is not only inconsistent with the notion of keeping efficiency financing bill neutral, but it is inconsistent with the use of a utility bill as the vehicle for consumer repayment.⁴

In addition to the need for standardization discussed immediately above, the need for a large volume of financing transactions will redound to the detriment of residential ratepayers. The need for a large volume of transactions flows from the financier's participation in the secondary market. Financial investors cannot successfully bundle small volumes of loans for securitization in the secondary market.

Generating a large volume of efficiency loans is at explicit odds with a public policy focus on audit-based deep retrofit energy efficiency treatments for residential dwelling units. Rather than standardized packages of efficiency measures, the direction not only of PGW efficiency investments, but of energy efficiency investments in Pennsylvania in general under the direction of the PUC, residential efficiency measures for PGW customers are intended to be based on energy audits performed at the customer's home to determine what package of interventions would be fit the needs of the particular home and the individual customer.

In contrast, a reliance on generating large volumes of financing transactions for energy efficiency measures has been found to generate a

⁴ This discussion sets aside any consideration of the consumer protections that would be needed to respond to, or prevent, unreasonable cross-selling of financial products. The discussion here is limited to the inherent conflicts that inhere in an OBF program.

significant reliance on contractors as the point of sale.⁵ Contractors, however, whether they are appliance vendors or housing contractors, are not equipped or skilled at performing the audit-based deep retrofit. Contractor-initiated sales (and the accompanying financing) tend to focus on single-element efficiency investments (e.g., the replacement of a heating system). Creating a system where this result is not only accepted, but encouraged by the very nature of the underlying financing, is contrary to the needs of the customer and contrary to the objective of a utility's DSM program as a whole.

A frequent occurrence of single-measure transactions removes the ability to bundle the easy to perform, high value, high impact efficiency measures with longer-term, deeper efficiency investments that rely on the shorter-term measures to bring the portfolio within an acceptable cost-effectiveness determination (and bill neutrality determination). Moreover, allowing single-measure retrofits to drive program participation leads to questions about whether these programs are delivering incremental energy savings or simply capturing existing market activity.

Inherent Consumer Protection Conflicts.

There is an inherent conflict between the consumer protections that are due a residential utility customer and the consumer protections that will be sought under an OBF program for energy

⁵ This discussion sets aside any consideration of the consumer protection requirements to prevent or respond to contractor mis- or malfeasance. Misrepresentations have frequently been found to arise from contractor participation in the origination of efficiency financing based on the extent to which, if at all, the contractor represents that it is representing the utility; the overstatement of expected usage reduction performance of particular efficiency measures; the extent to which the usage reduction measures are "free"; and similar problems. The point of this discussion is that a residential OBF inherently leans upon and promotes a reliance on contractor-originated financing of efficiency measures.

efficiency investments. An OBF regime seeks business processes that reduce the risk of customer nonpayment of the efficiency financing. In reducing that risk of non-payment of OBF obligations, however, basic residential utility service is placed in jeopardy.

Most financiers of energy efficiency investments seek to have the OBF program extend the right of a utility to disconnect service for nonpayment to the failure to make payments toward the financing of energy efficiency measures. Residential customers in Pennsylvania, however, are (and should be) protected from the disconnection of service for bills not arising from the delivery of basic utility service.

Similarly, financiers of energy efficiency investments to be repaid through an OBF regime generally seek that residential bill payments be prorated between payment of the underlying utility bill and repayment of the efficiency financing. Residential customers in Pennsylvania, however, are provided the protection that bill payments will not be prorated, but will instead be posted first against the bill for basic utility service. Even when OBF payments are in arrears, customer payments are applied first against bills for basic utility service.

Financiers of energy efficiency measures generally seek permission to have utilities with an OBF program impose the same late payment charges on unpaid OBF obligations that are otherwise imposed on unpaid utility bills. The impact of such a decision, however, is to convert the OBF scheme into a high-cost consumer loan. Pennsylvania PUC regulations allow utilities to impose a late payment charge not to exceed 1.5% per month (not to exceed 18% annual simple interest). The imposition of such high interest rates would not only further threaten the ability of the payment-troubled customer to whom such interest rates would be charged, but would threaten the underlying cost-justification of the energy efficiency investment with which to begin. No distinction is made, and no compensating consideration is provided, for any failure of the efficiency investment to achieve the bill

neutrality on which basis the efficiency measure was generally sold with which to begin.

Finally, providers of energy efficiency financing generally seek to have unpaid OBF payments included within the write-off of overall utility bills. The inclusion of unpaid OBF payments as a utility uncollectible will, of course, directly increase the cost of service to all utility ratepayers. It would be inappropriate to include energy efficiency financing dollars in utility uncollectible recoveries simply because the financier sought to piggyback its bill collection on utility bills. A utility should not be allowed to sell its billing and collection processes to the extent that the lack of success for the sold financing product will be viewed as a part of the utility's overall cost of service.

Cost-Justifying an OBF Program.

To pursue an on-bill financing program, a utility would need to quantify and present the dollarized cost to ratepayers of a move to OBF, as well as an assessment of the impact of those costs on the cost-effectiveness of efficiency measures that would be financed through OBF. The costs to residential ratepayers of arising from the adoption of an OBF program would be substantial. Categories of costs that have been identified throughout the nation include:

- The information technology changes that would be required to integrate on-bill repayment into the billing processes and nonpayment responses of the utility;
- The costs of creating business processes for the origination of OBF financing transactions;
- The monthly servicing costs of OBF transactions;
- The costs of modifying voice response systems and web access to enable OBF transactions (with any follow-up services required);

- The cost of packaging OBF transactions for the secondary market, and the interaction with purchasers within the secondary market;
- The cost of developing and implementing dispute resolution procedures. Disputes, of course, will arise not simply with the utility. Disputes may arise with the contractor performing the efficiency work; with the financier; with the originator of the loan; or with the holder of the loan (once the loan is sold in the secondary market). It will be the utility's obligation to have the capacity to address each of these types of disputes; and
- The cost of on-going oversight and management of the contractor network, both with respect to quality control and with respect to preventing and/or responding to mis- and/or malfeasance.

In addition to these direct costs, as discussed above, within the context of an on-bill repayment scheme, a utility would not provide money and hold the financed transactions. One critical element of any OBF regime is the packaging of the financing transactions for sale on the secondary market.

One cost that thus needs to be accounted for in any assessment of program costs is the over-collateralization of the loan pool to be sold in the secondary market. When loans such as these are packaged and sold, they are not sold at face value. Instead, loans are sold at a percentage of face value. One cost that a utility should thus quantify is the lost revenue attributable to the percentage discount that can be expected to occur in the sale of the loan pool.

In considering these costs, it is, of course, important to remember that OBF is not a stand-alone energy efficiency program. Rather, OBF is viewed by some as a means of expanding the market penetration of a utility's existing residen-

tial efficiency programs. OBF is only helpful if it can expand the market potential of the utility's residential efficiency programs. OBF would expand the market potential in one of two ways: (1) it allows the utility's residential DSM program to go wider (by increasing the number of program participants); or (2) it allows the utility's residential DSM program to go deeper (by increasing the number of measures that will be installed through the program). In this regard, financing energy efficiency doesn't matter unless and until the underlying product (i.e., the efficiency product) is sold.⁶

These observations are important because it is difficult, if even possible at all, for a utility to demonstrate that residential efficiency programs can absorb additional substantial (and ongoing) costs and maintain its residential programs as a cost-effective undertaking.

Fisher, Sheehan and Colton, Public Finance and General Economics (FSC) provides economic, financial and regulatory consulting. The areas in which FSC has worked include energy law and economics, fair housing, affordable housing development, local planning and zoning, energy efficiency planning, community economic development, poverty and telecommunications policy, regulatory economics, and public welfare policy.

⁶ The way to conceptualize this, for example, is to remember that an automobile loan is used only once the customer decides to buy the car.