Ratepayer-Funded Utility Bill Affordability:

A Path forward to Serve Low-Income Connecticut Residents

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Part 1. How Inability-to-Pay Equals Inability-to-Collect

The purpose of this paper is to discuss the rationale for, and expected impacts of, the adoption of ratepayer-funded bill affordability assistance. While the discussion below is undertaken within the context of the ongoing COVID-19 health pandemic, it is not driven by the pandemic. The economic crisis, as will be discussed in a later section of this paper, extends far beyond the need for what has traditionally been thought of as a low-income bill affordability program. The impacts of COVID-19 tend to extend to low-wage customers, a population that may ***include***, but is certainly not ***limited*** to, low-income customers. This paper concludes with a recommended ratepayer-funded utility bill affordability structure.

This section discusses various facets of unaffordable low-income utility bills. The different facets of unaffordability are dependent upon the perspective from which one views the problem. First, the discussion below considers unaffordability from the perspective of the utility. Second, the discussion turns to the impacts of unaffordable bills from a societal perspective.

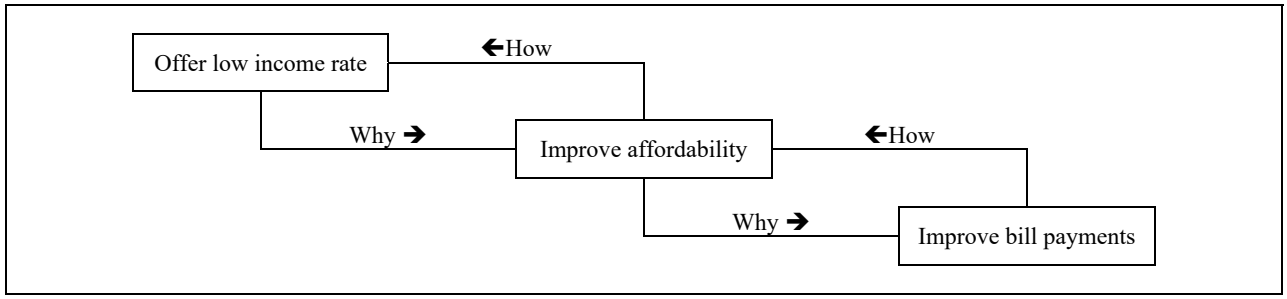
A. THE UTILITY PERSPECTIVE: BILL PAYMENT PROBLEMS.

The inability-to-pay on the part of the low-income customer base of Connecticut utilities also results in an inability-to-collect on the part of those utilities. Inability-to-pay and inability-to-collect are, quite simply, flip-sides of the same coin.

i. The Data Behind Inability-to-Collect Problems.

When considering whether to implement a low-income bill affordability program, the State of Connecticut should first articulate what it hopes to ***achieve*** through such a program. The purpose of a low-income discount is to improve the affordability of utility service to income-eligible customers who would face ***un***affordable bills in the absence of the discount.

In noting that "affordability" is the objective, it is important to remember that pursuing affordability, and thus offering a low-income discount, is a means to an end, not an end unto itself. The outcome which stakeholders seek to achieve through an affordable utility rate is the ability of income-challenged customers to take utility service under sustainable conditions. The rationale for a low-income rate is set forth in the decision-model set forth in the Figure below. As you move "down" the model, you answer the question "why." As you move "up" the model, you answer the question "how." Thus, why do offer a low-income rate"? To improve affordability. Why do you seek to improve affordability? To improve bill payments.



The discount being offered to low-income customers, in other words, is not simply a distribution of financial benefits to the poor because they are poor. Instead, a discounted rate is a mechanism through which a utility, in effect, seeks to purchase an increase in the ability of low-income customers to consume their utility service while making consistent, timely payments for that service with a minimum of collection intervention.

For purposes of assessing the viability of this objective, it is further important to know what utilities *currently* know about their inability-to collect. Once the baseline inability-to-collect is established, utilities have been put on notice that failing to acknowledge that information, and to respond accordingly, will be considered an inadequate and insufficient action.

Two approaches can be used to measure the outcomes of a bill affordability program.

- The first approach considers the "breadth" and the "depth" of a utility's inability-to-collect. First, one should look at the "breadth" of nonpayment. The breadth of nonpayment indicates the prevalence of unaffordable bills. It addresses the question: how many people/households/geographic areas have not paid their utility bills? This metric,

however, does *not* distinguish between by how big a bill is in arrears. A $10 bill that is unpaid is counted the same as a $100 bill that is unpaid. The metric, in other words, is a yes/no toggle. A bill for each utility studied is, on average, either paid or it is not. Second, one should examine the "depth" of nonpayment. The depth of nonpayment examines by how much a bill is in arrears. It helps to address the question: how unaffordable is a bill? An arrearage of $500, in other words, presents a larger depth of nonpayment than an arrearage of $100. Under the "breadth" analysis, these two customers would be treated the same (each counted as "1"). Under the "depth" analysis, the customer with an arrearage of $500 is recognized to have a greater problem.

- The second approach approaches the question from the perspective of the utility. Under this perspective, four different metrics can be used to measure the inability-to-collect from low-income customers who cannot afford to pay their bills:

    1. **Complete payment.** When a Connecticut utility bills $100, it wants to collect $100 from its customers. Paying something less than $100 means that the customer is not making a "complete" payment.

    2. **Timely payment.** When a Connecticut utility sends a bill with a due date 20 days after the billing date, it wants to collect its payment on or before Day 20. Even if a customer makes a complete payment, if that payment comes on Day 45, or on any other day after Day 20, the customer is not making a "timely" payment.

    3. **Regular payment.** When a Connecticut utility sends a bill for current service, it wants to collect a payment in response to that bill. If at the end of six months (representing six monthly bills), for example, even if two separate customers have both paid 100% of those bills, if Customer A made 100% of his/her payment in six (6) payments (1 payment per each bill), and Customer B made 100% of his/her payment in two (2) payments (1 payment for every 3 bills), Customer B would have made less regular payments.

    4. **Unsolicited payment.** When a Connecticut utility sends a bill, it wants to receive payment without needing to "chase" that payment. Even if the utility receives a complete payment from a customer, if that payment comes only after the utility needs to send a reminder notice, issue a disconnection notice, and perhaps even perform a disconnection of service, the utility is expending more resources in the process of collection than if the payment would have been "unsolicited."

While Connecticut utilities have traditionally not collected sufficient data to comprehensively assess these four metrics, much is known about the payment difficulties facing low-income

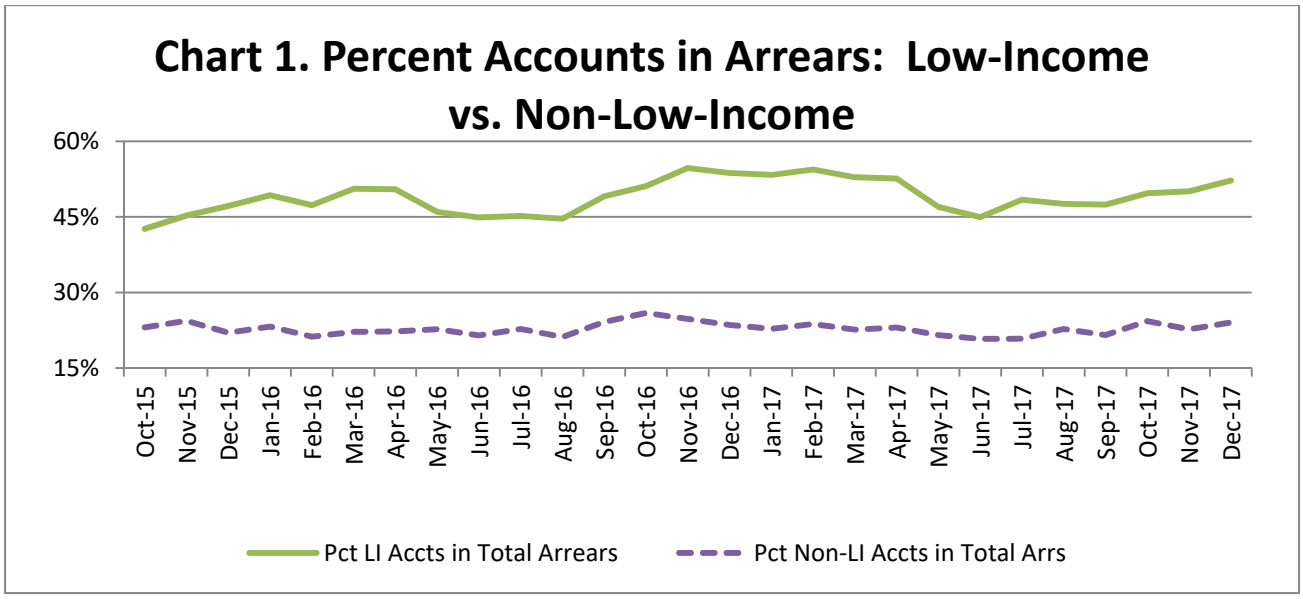
customers. However, experience from other utilities demonstrates how inability-to-collect can be measured and what results can be expected to be found.

Rhode Island (National Grid):[1] In assessing the *breadth and depth* of nonpayment, consider the performance of National Grid in Connecticut's next-door-neighbor, the state of Rhode Island to review an application of the distinction between the breadth and the depth of arrears. The discussion of the breadth of nonpayment is measured by a consideration of the incidence of arrears. A review of the incidence of National Grid's low-income arrears shows substantial continuing payment problems on the part of customers receiving the company's low-income discount. The "incidence" of arrears measures how frequently low-income arrears occur. There are two perspectives from which the incidence of arrears is considered: (1) the incidence of the total *dollars* that are in arrears; and (2) the incidence of the total *accounts* in arrears.

One should first look at accounts in arrears. An examination of accounts in arrears does not distinguish between how far in arrears a customer is. A customer who owes $10 is counted the same as a customer who owes $100. The question presented involves a determination of how many customers haven't paid their bills (called the "incidence" of arrears). Chart 1 reveals that the proportion of low-income accounts in arrears (*i.e.*, who had some amount of unpaid balance from a previous bill) consistently exceeds 45%, and is trending noticeably upwards. Chart 1 also reveals that the percentage of low-income accounts in arrears is more than two times greater than the percentage of non-low-income accounts in arrears.[2]

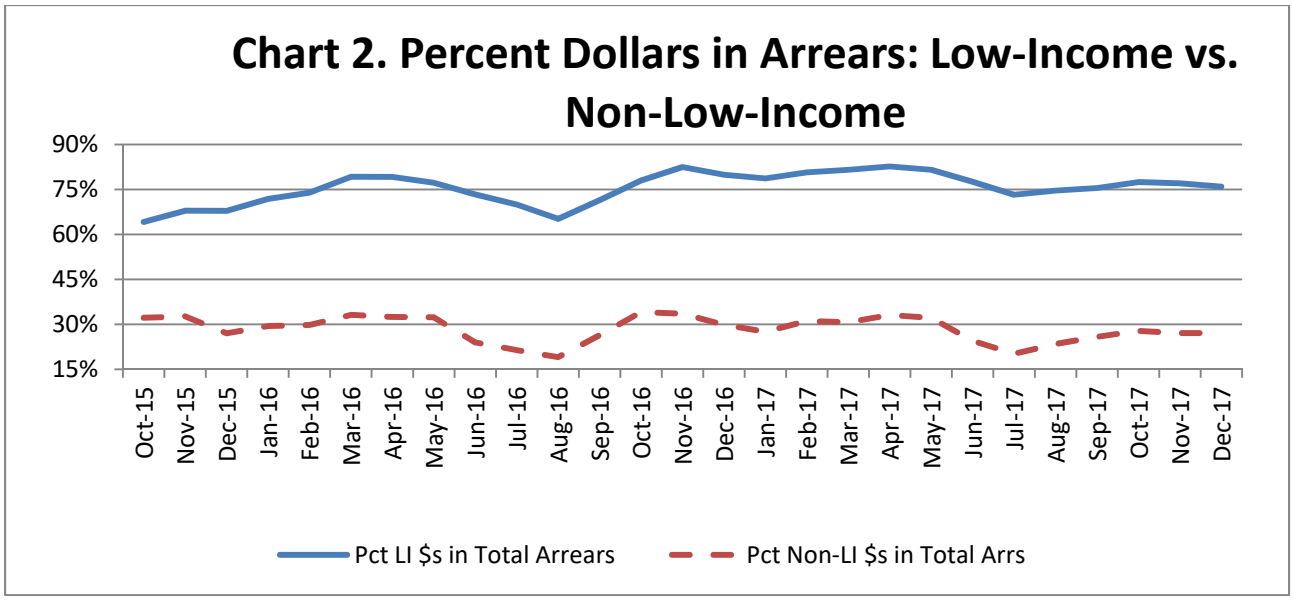
[1] In reviewing this Rhode Island data, bear in mind that National Grid has subsequently redesigned its bill affordability program to more clearly tailor the program toward achieving affordable bill burdens.

[2] An examination of percentages helps to ensure that one accounts for the underlying number of accounts and the size of the underlying bills. For example, the fact that the number of dollars in arrears (or number of accounts in arrears) increased is less meaningful if the reason for the increase is simply because there are more customers and thus more total dollars billed. Using a percentage helps factor that out.



In contrast to the percentage of ***accounts*** in arrears is an examination of the percentage of ***dollars*** that are in arrears. When a utility bills $100, it not only expects payment of that $100, but expects that payment to be made before it issues its next bill. If it doesn't receive payment, the next bill will include not only the bill for that month's current service, but also include the unpaid balance from prior months. Chart 2 below examines the percentage of total billings each month that are overdue from a prior month for National Grid (Rhode Island). If the percentage in Chart 2 is 50% in a particular month, for example, that means that half of the total dollars billed in that month were dollars that had been billed in a previous month but not paid by their due date.

What stands out about National Grid (Rhode Island) in Chart 2 is the fact that the percentage of billings in each month that are comprised of arrears (*i.e.*, unpaid balances from a prior month) is substantially higher for low-income customers than for non-low-income customers. The percentage of low-income billings comprised of arrears has exceeded 75% since October 2016. In each month, in other words, for every $100 appearing on a National Grid bill to a low-income customer, $75 has also appeared on a previous bill but gone unpaid. In contrast, the non-low-income billings comprised of arrears consistently falls below 30%. In each month, in other words, more than two times the proportion of dollars billed to low-income customers represent unpaid balances from a prior month than the proportion for non-low-income customers. Low-income customers are less likely to receive their bill for current service and pay that bill in the month in which it is due.



In Rhode Island, there is other cause for concern about low-income arrears. It is not simply *total* arrears that shows a high and increasing trend for low-income customers, it is the percentage of total arrears that constitute *long-term* arrears as well. When bills go unpaid, utilities track the "age" of those arrearages. A customer who simply misses a payment, and then makes that payment up the next month, would be reflected in an "aging bucket" listed as "1 – 30 day" arrears. In contrast, a person who has missed eight payments would be listed in the bucket of "240-day" arrears; 10 payments in the bucket of "300-day arrears"; 12 or more payments in the bucket of 360+-day arrears; and so forth. The older an unpaid balance becomes, the more concern it presents from the perspective of a utility asking "are we ever going to collect this?"

Chart 3 and Chart 4 show that the percentage of total National Grid arrears that are comprised of long-term arrears is high and increasing as well. This discussion again distinguishes between the number of accounts in arrears and the number of dollars of arrears. Both charts use a similar ratio.

- Chart 3 examines dollars. The numerator includes the dollars of long-term arrears appearing on bills in each individual month; the denominator is the total dollars in bills (arrears plus bills for current service)

- Chart 4 examines numbers of accounts. The numerator includes all accounts that have some long-term unpaid balance (*i.e.*, an arrearage) appearing on the bill in each month. The denominator includes all accounts receiving a bill in that month

The discussion below defines "long-term arrears" in two different ways: (1) arrears that 240 or more days old and (2) arrears that are 360 or more days old. From the perspective of dollars

(Chart 3), the data shows that while the percentage of low-income arrears that are comprised of arrears 360 or more days past-due began at somewhat more than 10% in October 2015, that percentage had increased to nearly 30% by December 2017. The percentage of billed dollars that are comprised of arrears 240 or more days past-due began at less than 30% in October 2015 and increased to more than 40% by December 2017. In contrast, non-low-income long-term arrearages show neither the same magnitude nor the same upward trend.

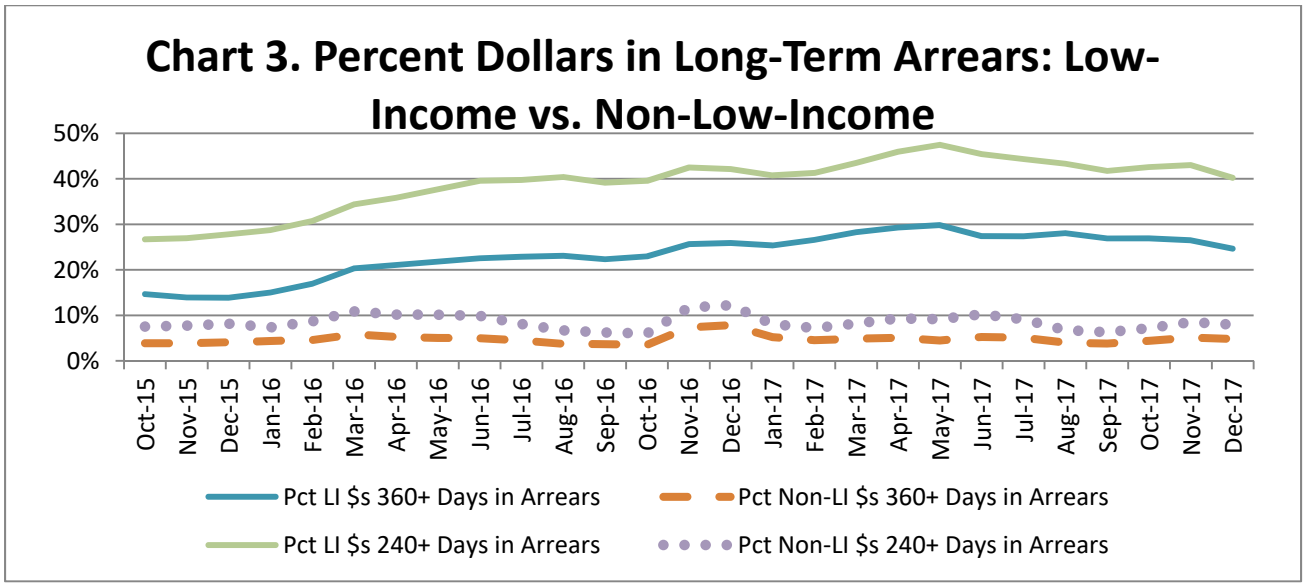
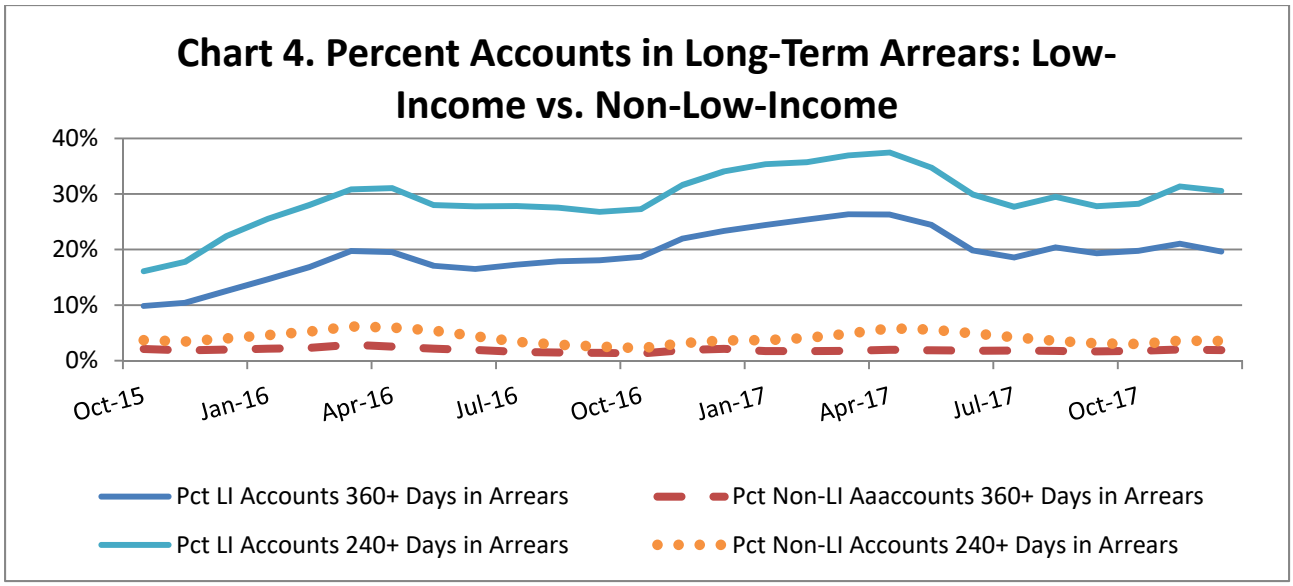


Chart 4 reveals the same pattern for National Grid (Rhode Island) low-income accounts in arrears as compared to non-low-income accounts in arrears. Not only is the proportion of low-income accounts in long-term arrears high and getting higher over time, but the corresponding proportion of non-low-income accounts in long-term arrears is reasonably low and remaining flat.



In sum, the discussion above shows that low-income National Grid (Rhode Island) customers have a higher *incidence* of arrears. "Incidence" shows that a higher proportion of low-income customers (than non-low-income customers) are in arrears. The incidence of arrears does not distinguish between the level of an unpaid balance. Someone who owes $100 is counted the same as someone who owes $1,500; they both constitute "one account in arrears." The higher incidence is seen in both the number of dollar of arrears and the number of accounts in arrears. Low-income customers of National Grid (Rhode Island) have a greater "breadth" of arrears than do residential customers as a whole.

In addition to the incidence (*i.e.*, "breadth") of arrears, one should also consider the *depth* of arrears. The "depth" of arrears considers how much money a customer owes a utility in unpaid bills. A customer with an arrearage of $500 is deeper in arrears than a customer who is $100 in arrears. Having many customers with high arrears is of more concern that having many customers with small arrears. Accordingly, Charts 5 and 6 below examine the average dollars of arrears per account within differing aging buckets. The Charts compare the average arrears of low-income customers in each month to the average arrears of non-low-income customers for National Grid (Rhode Island).

Chart 5 presents the average arrears for shorter-term (arrears that are 30-59 days old) and medium-term (arrears that are 60-89 days old) balances.[3] National Grid's data shows that while the average non-low-income customer in arrears owes the Company a balance of less than $250 for both age buckets (30-59 days, 60-89 days), the average low-income customer has a balance

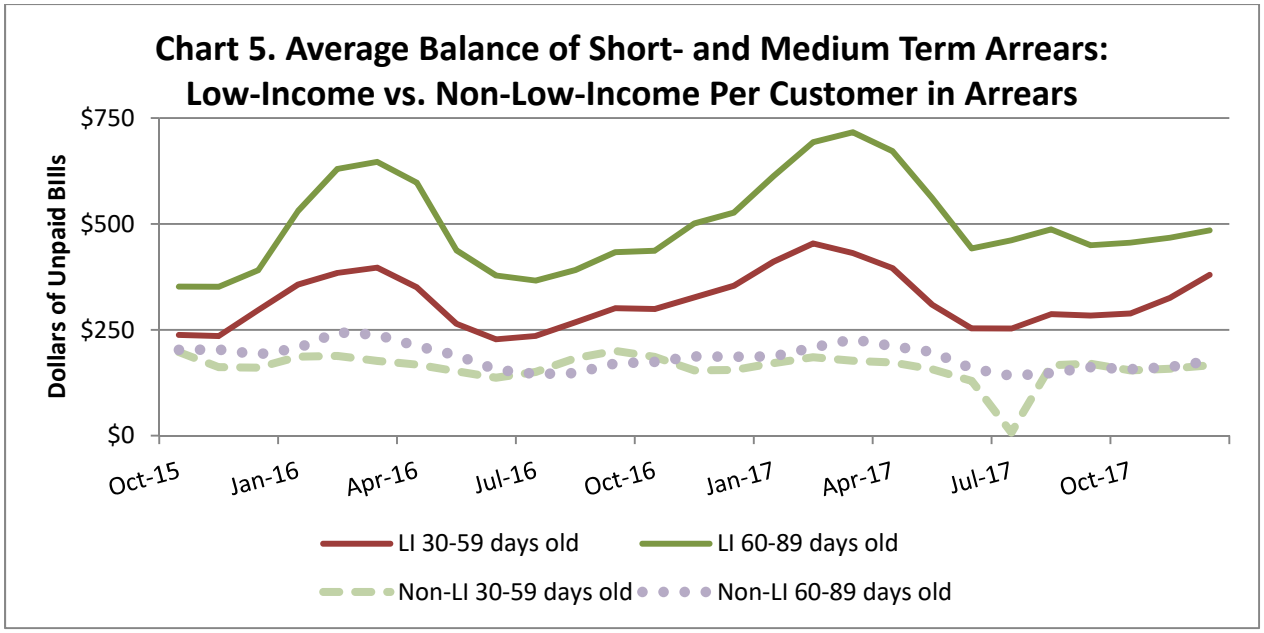
[3] Accounts that have unpaid balances that are only 1 – 30 days old present less risk to those concerned with whether a customer may ultimately pay his or her bills. These short-term arrearages represent unpaid balances that someone is likely to retire with no undue risk to the utility. Those balances are thus set aside for the analysis herein.

that is noticeably higher (and increasing). Low-income customers that have unpaid balances 60 – 89 days old are carrying unpaid bills of $500 or more. To illustrate the difference, in Chart 5:

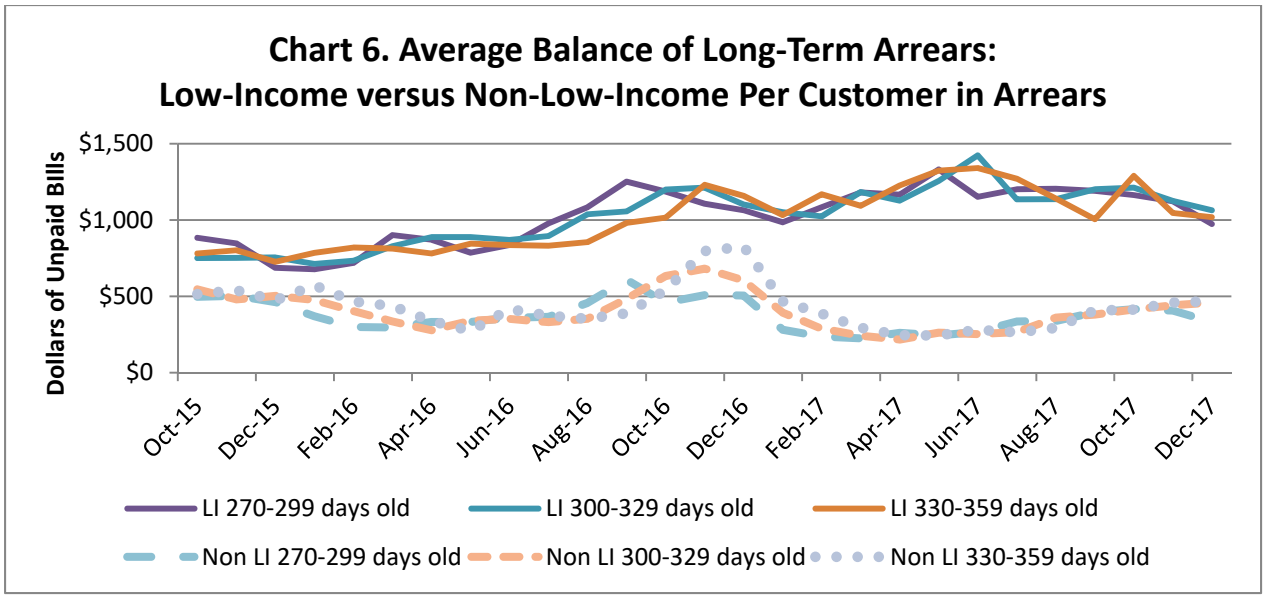
- The October 2015 low-income balance for an unpaid bill 60 – 89 days old ($351.84) was roughly 1.5 times higher than the non-low-income balance for the equivalent age ($202.74).

- In December 2017, the average unpaid balance for low-income accounts 60 -89 days in arrears ($484.80) was 2.75 times higher than the average balance for non-low-income accounts of the same age ($176.45).

When this data is considered along with the data previously discussed, it is evident that not only are more low-income customers in arrears (*i.e.*, the incidence of arrears is higher), but National Grid (Rhode Island) low-income customers have larger arrears as well (*i.e.*, the depth of arrears is greater).



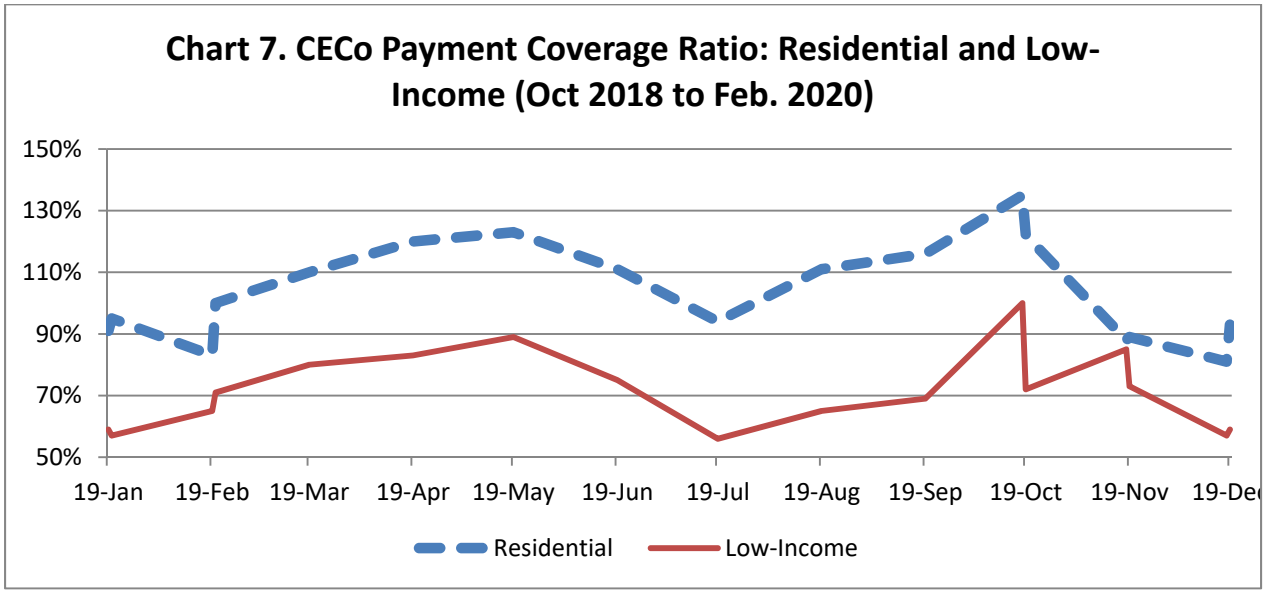
The same patterns are found for longer-term unpaid balances. Indeed, not only are the differences in dollar levels between low-income and non-low-income customers much bigger for longer-term arrears, but the upward trend in the average unpaid balance for National Grid's low-income customers is more pronounced as well. The data is presented in Chart 6 below. Unpaid balances for low-income accounts in arrears exceed $1,000 for all three aging groups of 270 days to 359 days in 2017. In contrast, the unpaid balance for non-low-income arrearages in 2017 does not exceed $500 for any of these three aging groups.



In reaching conclusions based on this data, remember that the purpose of a low-income discount is to help low-income customers make sustainable bill payments. National Grid's then-existing low-income discount did not provide low-income customers an effective opportunity to achieve that objective. Low-income customers have not only a high incidence and depth of arrears in the short-, medium- and long-term, but both their incidence and depth of arrears are increasing as well.

The four metrics identified as measuring inability-to-collect from the perspective of the utility are illustrated below by reference to data from Consumers Energy (CECo), a Michigan-based combination gas/electric utility.

Michigan (Consumers Energy): The first facet of inability-to-collect examined is the extent to which the unaffordability problems facing Consumers Energy customers translate into issues with "complete" payments, measured by the "payment coverage ratio." The payment coverage ratio places the dollars actually received in the numerator and the dollars billed in the denominator. If a customer's payments equal the customer's bills, the payment coverage ratio is 100%. If the customer's payments equal half of the customer's bills, the payment coverage ratio is 50%. That payment coverage data is summarized in the Chart immediately below. The residential payment-coverage ratio by month is the dashed line while the low-income payment coverage ratio by month is the solid line.



A number of observations stand out from looking at Chart 7 above. First, CECo's Payment Coverage Ratio for residential customers as a whole is substantially higher than for low-income customers. Over the 17-month study period,[4] the cumulative residential Payment Coverage Ratio (cumulative payments divided by cumulative bills) was 101%. In contrast, the low-income Payment Coverage Ratio for that 17-month period was only 71%. That means that, as a whole,[5] low-income customers were paying only $70 for every $100 they received as their bill. Second, for the residential population as a whole, in 9 of the 17 study months, CECo collected more than it billed (*i.e.*, had a Payment Coverage Ratio of 100% or more); in 13 of the 17 months, CECo collected 90% or more of what it billed. In contrast, with the low-income customer base, in five months, CECo's Payment Coverage Ratios were lower than 60% (*i.e.*, CECo collected fewer than $6 for every $10 billed). In three more months, the Payment Coverage Ratio was less than 70% (but higher than 60%).

The point here is not to critique or assess CECo's collection practices. Rather, the point is to compare low-income payment patterns to the payment patterns of residential customers as a whole.

[4] Data was collected beginning in October 2018. That month was selected to allow for at least one full heating season to be included in the data (October 2018 – February 2020).

[5] The Payment Coverage Ratio does not reference individual customers. For example, if Customer A began with a $100 arrears and completely retired it, while Customer B began with a $0 arrears and ended with an arrears of $110, the Payment Coverage Ratio would be less than 100%. Similarly, if Customer A began with a $100 arrears and completely retired it, while Customers B and C began with a $0 arrears and ended with arrears of $50 and $60 respectively, the Payment Coverage Ratio would be less than 100%.

Consistent with the four metrics identified above, the "regularity" of payments is measured by the number of payments made as a function of the number of bills rendered. As stated above, when CECo issues a bill, it wants a payment in response to that bill. The Payment Regularity Ratio places the number of payments in the numerator and the number of bills in the denominator. If the ratio is 1.0, customers are making exactly one payment for each one bill that has been rendered. In making this calculation, the size of the payment is not considered (*i.e.*, the *size* of the payment is considered in the Payment Coverage Ratio discussed above). A payment of $10 is considered equal to a payment of $100 for purposes of the Payment Regularity Ratio.

Over the 17-month study period (October 2018 through February 2020), residential customers had a substantially higher Payment Regularity Ratio than did low-income customers. For the 17-months as a whole, while residential customers as a whole made 91 payments for each 100 bills rendered (a Payment Regularity Ratio of 0.91), low-income customers made 68 payments for each 100 bills rendered (a Payment Regularity Ratio of 0.68).

The third metric involves the timeliness of payments. One way to examine the "timeliness" of payments is by examining the aging of the dollars of arrears. CECo provided data for October 2018 through February 2020 from which monthly "roll rates" were calculated. "Roll rates" are the rate at which the previous month's aging bucket rolls into the subsequent month's next aging bucket (*i.e.* are not paid).[6] A higher roll rate means that a higher percentage of arrears remains in that aging bucket (*i.e.*, rolls forward). For purposes here, in other words, the higher the roll rate, the older an arrearage is and the less timely are payments which are being made by residential customers or by low-income customers.[7]

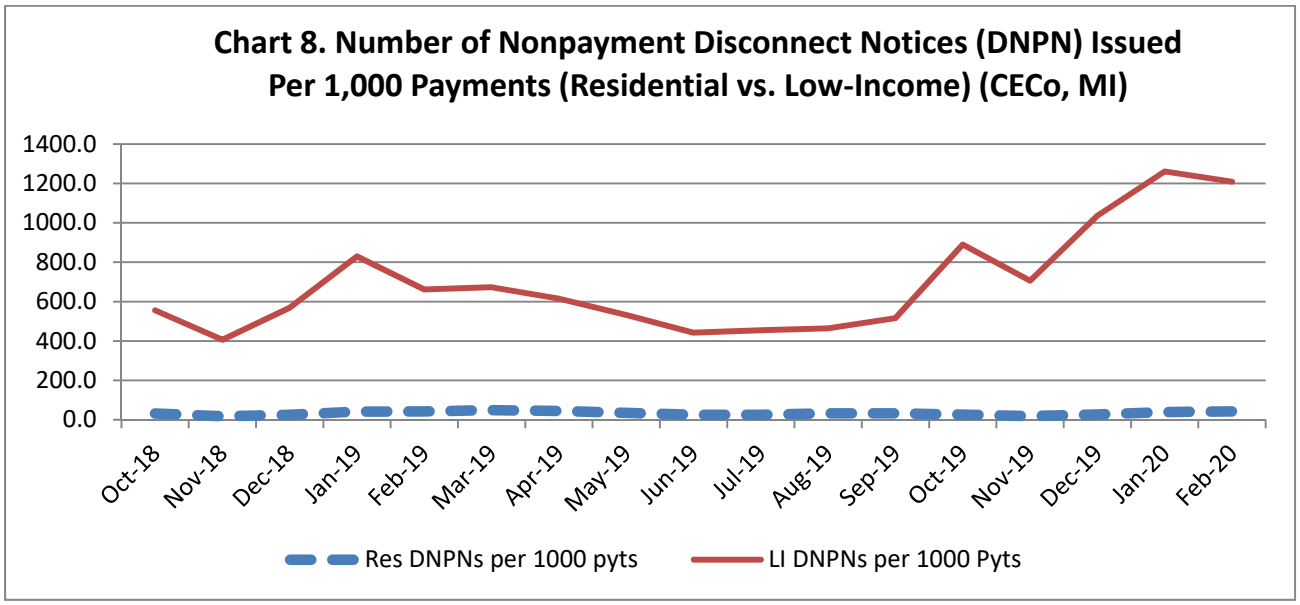
CECo's low-income customers make consistently less timely payments than do residential customers as a whole. In the 13 months of data, low-income customers had a higher percentage of arrears outstanding at Day 150 than did residential customers as a whole. For example, in January 2019, while 8.25% of low-income arrears were still outstanding (at the Day 150 mark), only 5.74% of residential arrears were. Indeed, in nine of the 13 months, the percentage of low-income arrears remaining at Day 150 was two times (or nearly so) higher than the residential percentage. In April 2019, for example, the low-income rate was 8.79% compared to a residential rate of 4.52% in April. In July 2019, the low-income rate was 10.11%, compared to a residential rate of 4.61% in July. In January 2020, the low-income rate was 10.37%, compared to a residential rate of 5.09% in that same month.

[6] An "aging bucket," for example, refers to customers who are 1 – 30 days in arrears, 30 – 60 days in arrears, 60 – 90 days in arrears, and higher. Different utilities use different top codes for their aging buckets.

[7] The purpose here is not to assess how well CECo is doing in collecting its arrears. The purpose here is only to compare low-income arrears to residential arrears to see if low-income customers make payments in a more timely fashion, or in a less timely fashion, than do residential customers generally.

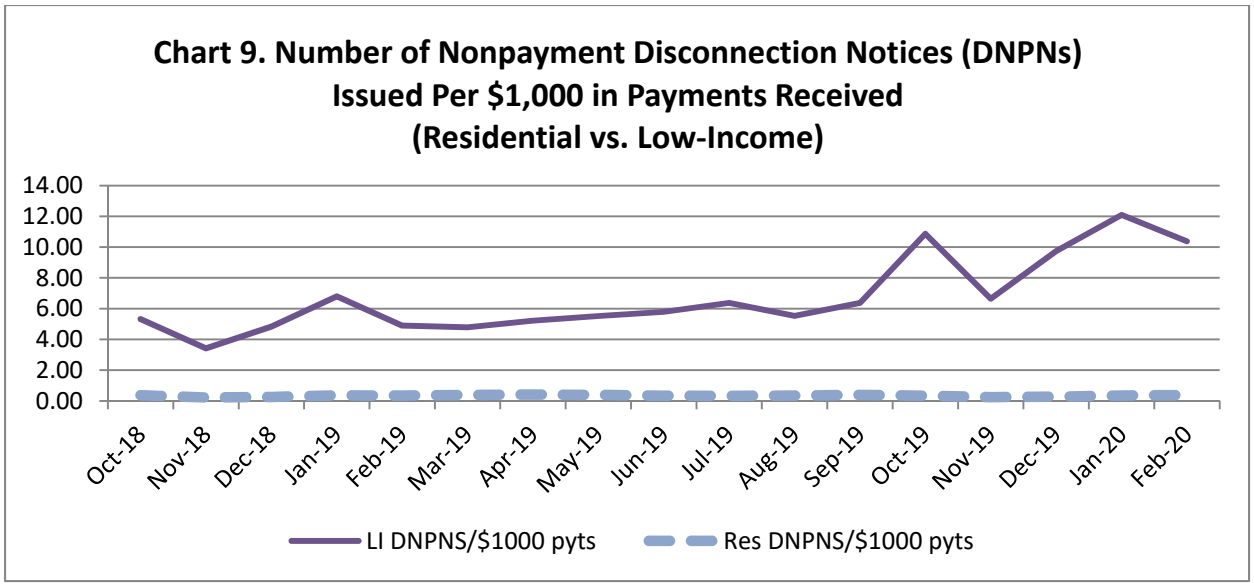
Finally, it is possible to assess how hard a utility such as CECo (or a Connecticut utility) has to work to collect from residential and low-income customers. There are two separate but related metrics examined below: (1) the number of disconnection notices that CECo issues for each 1,000 payments it receives; and (2) the number of disconnection notices for each $1,000 in payments CECo receives.

Chart 8 immediately below presents the number of disconnect notices that CECo issues for every 1,000 payments it receives from its low-income and from its residential customer base. A lower figure indicates that the Company sends fewer notices for every 1,000 payments it receives. The exact numbers are not as important for the discussion here as is the location of the residential line (dashed line) to the low-income line (solid line).



The analysis is a simple ratio. The number of disconnection notices CECo issues each month is placed in the numerator and the number of payments it receives each month is placed in the denominator. Chart 8 above demonstrates that CECo works much less hard for its residential payments than it works for its low-income payments.

In addition, Chart 9 below shows the same data, but uses the dollars of payments rather than the number of payments. The dashed-line at the bottom of Chart 9 shows that residential customers as a whole receive substantially fewer disconnection notices for every $1,000 in payments that CECo receives than do low-income customers (solid line). While low-income customers receive from four to twelve disconnect notices for each $1,000 payments they make, residential customers receive fewer than 1.0 disconnection notice for each $1,000 in payments they make.



In sum, data comparing the payment performance of low-income customers facing bills which they are unable-to-pay to the payment performance of residential customers generally shows that when utilities have customers with an inability-to-pay, the utilities also face an inability-to-collect. The offer of low-income discounts designed to reduce bills to an affordable burden is reasonably designed to address that problem.

Corroborating Data from Additional States: Both the National Grid and the CECo information presented above is uniformly consistent with data that has been generated for natural gas and electric utilities in other states. Not only each set of data unto itself, but the group of states taken as a whole, demonstrates that low-income customers suffer from a greater baseline inability-to-pay than residential customers generally. The data also demonstrate the relationship between low-income inability-to-pay and the utility's inability-to-collect.

For example, Connecticut utilities can learn many lessons from utilities serving low-income Maryland residents in the energy (gas and electric) industries. Data from Maryland demonstrate that low-income customers are not only more likely to be in arrears, but, also, that those who are in arrears are more likely to be deeper in arrears. In its 2007 evaluation[8] of the Electric Universal Service Program ("EUSP"),[9] the PA Consulting Group compared a variety of attributes of

[8] PA Consulting (May 2007). Electric Universal Service Program Evaluation: Final Evaluation Report, prepared for Maryland Public Service Commission. (hereafter, "PA Consulting"). Available at http://webapp.psc.state.md.us/intranet/reports/EUSP051107.pdf.

[9] Maryland Public Service Commission (2014). Electric Universal Service Report: 2014 Annual Report, at 1, prepared for the General Assembly of Maryland. ("The Electric Universal Service Program ("EUSP"), enacted as part of the Electric Customer Choice Act of 1999, was designed by the Maryland General Assembly to assist low-income electric customers with retiring utility bill arrearages, making current bill payments, and accessing home weatherization following the restructuring of Maryland's electric utilities and electricity supply market. The Act,

payment difficulties, including but not limited to the number of elapsed days after receiving a bill before making a payment, the completeness of payment,[10] the regularity of payments,[11] and the continuity[12] of payments.[13] PA Consulting found that "all households" outperformed low-income customers on each of these payment metrics. [14]

Table 1. Low-Income vs. All Residential Customers
Selected Payment Performance Indicators

	Completeness of Payment	Regularity of Payment	Continuity of Payment	Elapsed Days before Payment
Low-income customers	83.6%	70.0%	0.30	32.6
All customers	97.6%	86.8%	0.52	21.8

As can be seen from the Maryland data, "all households" paid a higher percentage of their bills, made more payments in response to bills, and exhibited more regularity in payments than did low-income customers prior to their participation in EUSP. The Table presents data comparing low-income performance to residential performance as a whole. Even when Maryland's low-

codified as Section 7-512.1 of the Public Utilities Article, Annotated Code of Maryland ("PUA §7-512.1" or "EUSP Legislation") required the Public Service Commission of Maryland ("Commission") to establish the program, make it available to low-income electric customers Statewide, and provide oversight to the Office of Home Energy Programs ("OHEP"), the arm of the Department of Human Resources ("DHR") responsible for administering the EUSP.")

[10] "The completeness index is an indicator of the percent of the total bill for which the household was responsible that was paid during the before and after periods." PA Consulting, *supra*, at 4-3.

[11] The regularity index "is the percentage of payments the customer made compared to the number of billings." PA Consulting, *supra*, at 4-4.

[12] The "continuity of payment" is measured as follows according to PA Consulting: "The continuity index is the sum of the square of payments made in sequence divided by the square of the number of billings in the study period. Thus, if a participant makes 12 payments in a row and there are 12 billing periods then the continuity index is 12^2 / 12^2 or one. This means that the participant consistently paid the electric bill. The continuity index is structured so that the more payments that are made in sequence, the higher the continuity index. A household that made 9 of 12 payments in contiguous months would have a continuity index of $9^2/12^2$ or 0.56. A household that made 9 of 12 payments where four and five of the payments were in sequence, would have a continuity index of $(5^2 + 4^2)/12^2$*100 or 0.28. The three missed payments could have been dispersed at the beginning, middle, or end of the study period; have all been at the beginning, middle, or end; or in some other combination. A final illustration is that nine payments made in clusters of 3 would result in a continuity index of $(3^2 + 3^2 + 3^2)/12^2$ or 0.19. The continuity index captures how payments are made in sequence." PA Consulting, *supra*, at 4-4.

[13] The continuity index "is an indicator of how consistently payments were made. For example, making nine payments in a row would yield a higher consistency score than making three payments in a row." PA Consulting, *supra*, at 4-4.

[14] "Low-income" is defined as a participant in the Maryland EUSP program prior to their entry into EUSP. All EUSP participants, however, receive federal fuel assistance through the Maryland Energy Assistance Program ("MEAP"). The reported performances would, as a result, be better than low-income customers not receiving MEAP. MEAP serves a fraction of all Maryland low-income customers.

income energy customers did make payments, PA Consulting found, they were less regular and less continuous. Moreover, low-income households making payments took more days before making their payments.

In addition to the data from Maryland, the Pennsylvania PUC's Bureau of Consumer Services publishes an annual report on "collections performance" for that state's natural gas and electric utilities. The data in Table 2 below show that nearly three times more low-income electric customers (26% vs. 9%) are in arrears. However, not only is a higher percentage of accounts in arrears, but, in addition, those who are in arrears are deeper in arrears. The average dollar level of low-income natural gas arrears is more than 20% higher than residential customers as a whole. The resulting collections outcomes are thus not surprising. Pennsylvania utilities disconnect service (for nonpayment) to between three and four times more low-income customers than they do to residential customers generally. Having disconnected service to that many low-income customers, the bad debt rate (in terms of percentage of billed revenue) is between three and four times higher for low-income customers than it is for residential customers as a whole.

Table 2. Collection Impacts of Low-Income and Residential Customers (Pennsylvania) (2015)[15]

	Electric		Natural Gas	
	Residential as a whole	Low-Income	Residential as a whole	Low-Income
Percent accounts in arrears	9.1%	25.9%	9.3%	18.2%
Average dollars of arrears	$452	$672	$470	$566
Termination rate	4.4%	15.8%	3.9%	12.0%
Bad debt rate	2.3%	9.8%	3.9%	14.0%

The data presented above is important for reasons other than demonstrating why Connecticut's utilities should be offering income-based bill affordability programs. Experience counsels that people often consider the fact that low-income customers have greater affordability problems than do non-low-income customers to be self-evident and, as a result, do not give the notion that these problems can be measured, quantified, and controlled much additional thought. When viewed as self-evident, people fail to translate the inability-to-pay into the various manifestations of the inability-to-collect. Flowing from this failure is a reaction to the low-income affordability problem as though such unaffordability is exclusively a "social" problem. The correlative

[15] The annual BCS Report on Universal Service Programs and Collections Performance can be accessed at: http://www.puc.state.pa.us/filing_resources/universal_service_reports.aspx.

argument is that it is not the role of a public utility to address such a "social" problem. This approach fails to consider the resulting business problems associated with inability-to-pay and inability-to-collect. The approach fails to consider the fact that a utility can take steps to control and improve its ability-to-collect.

The detailed discussion above confirms that an unaffordability problem viewed as an "inability-to-pay" from a social perspective is also an "inability-to-collect" from the utility's perspective. When seen as a utility's inability-to-collect the bills it is rendering for service, low-income unaffordability is not merely a social problem, it is a business problem which the utility not only *can* address through responsive actions, and but *needs* to do so as well.

ii. The Regulatory Principles behind Addressing Inability-to-Collect Problems.

The discussion below explores several regulatory principles that Connecticut can, and should, use as a framework to justify the offer of income-based bill affordability programs given the data discussed above. Each of these principles falls squarely within a traditional regulatory framework.

Least-cost service provision: First, Connecticut utilities have an obligation to provide service within a least-cost framework. This regulatory principle is not unique to questions of how to respond to inability-to-pay. This principle pervades utility regulation. One question, for example, with utilities involves the question of insurance. The issue poses itself as to which insurance alternative is least-cost: self-insurance or the purchase of insurance. A second question involves how a utility should handle "cash." The regulatory review is whether a utility should pay bank fees, or whether it should maintain compensating bank balances.

Least-cost service has also been at the heart of much of the regulatory debate regarding utility investments in energy efficiency over the past several decades. The question posed is whether investments in producing natural gas or electricity, or investments in reducing the consumption of natural gas or electricity, result in the least-cost provision of service. A related issue in today's world presents the same least-cost question with respect to environmental clean-up. Is it lesser cost to produce additional natural gas or electricity, and engage in the clean-up of the production facilities, or is it lesser cost to avoid the production of greenhouse gasses with which to begin by instead investing in usage reduction measures?

The principle of least-cost service is engrained into utility regulation. For example, any regulatory review of the source of financing for a public utility is judged on least-cost principles. Moreover, the source of natural gas or electric power purchases is constrained by the least-cost provision of service.

The same principle applies to a utility's response to nonpayment due to inability-to-pay. The question a utility faces is whether it can make investments, in resources or policies, that will result in a more effective, more efficient, more cost-effective and cost-efficient response to the nonpayment problems which its customers are facing. Further in doing so, can the utility mitigate the costs that will arise if it fails to make such investments?

In short, one regulatory principle that Connecticut should articulate as governing a utility's response to inability-to-pay involves the dictate that utilities should pursue those activities resulting in the least-cost provision of service.

Doctrine of avoidable consequences: A second regulatory principle Connecticut can and should use to justify income-based low-income affordability programs is the obligation of a utility to undertake those reasonable actions that can mitigate the harms of inability-to-pay before such harms arise. In this sense, a utility is not a passive observer of the adverse economic consequences of an inability-to-pay. There is little question but that non-paying customers impose costs on a utility and its remaining ratepayers. As the Pennsylvania Public Utility Commission's (PUC) Bureau of Consumer Services found nearly 30 years ago in its report based on its investigation into the control of uncollectible accounts - which findings remain valid today - "ratepayers are already bearing significant costs attributable to the problems of payment troubled customers and uncollectible balances. Further, BCS believes incorporating the following recommendations into utility operations will lead to a more rational and cost effective use of existing resources. Over time, proper implementation of the recommendations may result in a reduction of total utility costs."[16]

Costs associated with termination include: transaction costs of notice, disconnecting service, engaging in collection activity, and writing off uncollectible debt. In addition, utility terminations generate hidden costs as terminated customers go underground --changing names on accounts, moving to new addresses (whether within or without the jurisdiction of the utility) and the like-- or enlist advocates to fight the termination. All these activities impose costs on the utility in the form of increased legal, transaction, and monitoring costs.[17]

There are few principles regarding remedies as well established as that of a claimant's duty of mitigation. To reference the "mitigation of damages," however, while serving as the conceptual

[16]Bureau of Consumer Services, Pennsylvania Public Utility Commission, Investigation of Uncollectible Balances: Final Report to the Pennsylvania Public Utility Commission, at 6 (Feb. 1992) (recommendations excluded).

[17]These include the costs associated with approving and starting up new accounts, and greater scrutiny of new accounts, and increased collection costs and legal fees. In addition the company may have lost forever a potentially profitable account. A utility with a reputation as a hard-core collector of fees risks loss of good will and encouraging subversive behaviors as well. Leff, "Injury, Ignorance and Spite, the Dynamics of Coercive Collection," 80 Yale L.J. 1, 5 -10 and 35 (1970). Available at: https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?article=3821&context=fss_papers.

basis, may be somewhat of a misnomer. The applicability of this doctrine in the utility regulatory context falls more squarely within the doctrine of avoidable consequences. Under this doctrine, an adverse party may *not* be held liable for consequences that her victim could have avoided by the victim's own reasonable conduct. The same principle applies in the context of utility regulation. Where a utility knows, or has reason to know, that the income of a consumer is simply inadequate to meet the demands for each month's current bill payment, it is reasonable to direct the utility to take action which would reduce the expectation of an unpaid bill *ab initio* so as to allow the utility to collect what it can.

The rule has direct applicability to utility regulation. It is not merely common, but universal, that public utilities have an obligation to mitigate the harms or damages arising from utility operations when the actions of others might increase prices to ratepayers. Consider, for example, utility commission regulations that explicitly provide that as a part of a prudent planning effort to secure adequate natural gas supplies for their customers, natural gas utilities should structure their portfolios of contracts with various supply and pricing provisions in an effort to mitigate upward natural gas spikes, and provide a level of stability of delivered natural gas prices. Utilities have been found to be in contravention of this principle when they have adopted gas procurement practices based on a strategy that is a gamble based on a hope that market prices would decline. In short, the doctrine of avoidable consequences serves as the basis for a gas utility's obligations to mitigate gas volatility.

The second regulatory principle governing the costs associated with low-income inability-to-pay involves mandating that utilities undertake those activities that result in the mitigation of the avoidable system-wide consequences of that inability-to-pay.

Efficient and Economical Management: The third principle that should be considered is that the pervasive inability-to-pay facing low-income customers does not relieve a Connecticut utility from its obligation, as a regulated public utility, to operate in an efficient manner. From a collections perspective, efficiency is measured not merely by the metric of how much money is collected but also by the metric of how much is collected given the level of effort involved. Improvements in efficiency of collection activities can occur in either of two ways:

1. Reduce the effort. The need for collection interventions can be reduced thus allowing an increased payment per each collection intervention performed;[18] or

2. Increase the result. The customer response to the collection activity can improve thus allowing an increased payment per each collection intervention performed.[19]

[18] In this first instance, improvement can be seen even if total dollars collected remains the same (but the number of interventions needed to generate those dollars decreases).

In essence, a Connecticut utility should be expected to improve the efficiency of collection activities from two different but related perspectives. On the one hand, the utility's efforts should be considered *vis a vis* how much revenue (outputs) is generated by each collection intervention. On the other hand, the utility's efforts should be considered *vis a vis* how many collection activities (inputs) are needed to generate the revenue.

A review of efficient and economic management is frequently undertaken when considering an investor-owned utility's return on equity. A return on equity is based on a finding of efficient and economic management. Without the application of such a principle, a utility would lose all incentive to operate in an efficient, cost-effective manner, thereby leading to higher operating costs and eventual rate increases.

This principle is grounded in one of the most famous U.S. Supreme Court decisions regarding public utility regulation. The Supreme Court of the United States left no doubt in its Bluefield decision that efficient and economic management must be considered in the context of setting the allowed return on a utility company's rate base: "The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, *under efficient and economic management*, to maintain and support its credit, and enable it to raise money necessary for the proper discharge of its public duties." Bluefield Water Works & Improv. Co. v West Virginia Pub. Service Commission, 262 U.S. 679, 693 (1923) (emphasis added).

The third fundamental regulatory principle supporting the offer of income-based bill affordability programs for low-income customers facing an inability-to-pay, and thus a utility facing an inability-to-collect, is the obligation to operate in the most efficient and economic manner possible.

[19] In this second instance, improvement can be seen if the total number of collections activities remains the same but the dollars generated by those activities increase.

B. THE SOCIAL PROBLEMS OF HOME ENERGY UNAFFORDABILITY.

As a result of the mismatch between energy bills and the resources needed to pay them in Connecticut, as demonstrated above, many low-income households incur unpaid bills and experience the termination of service associated with those arrears. In addition, the paid-but-unaffordable bill is a real phenomenon in Connecticut. Even when low-income households pay their bills in a full and timely manner, they will often suffer significant adverse hunger, education, employment, health, and housing consequences in order to make such payments. These consequences generate adverse impacts not only for low-income customers and the utilities that serve them, but they also generate adverse impacts on the competitiveness of business and industry that are members of the broader Connecticut community. The discussion below considers an array of consequences arising from unaffordable home energy.

The findings of the unaffordability of home energy in Connecticut are sobering from a social perspective. The unaffordability of energy manifests itself in more than simply unpaid bills. While researchers have not studied the issue specifically in Connecticut, U.S. research is informative. According to a series of survey studies published by the National Energy Assistance Directors Association (NEADA),[20] "despite. . .significant residential energy expenses, most low-income households pay their energy bills regularly. But at what cost?" The NEA survey found that "LIHEAP recipients faced life-threatening challenges."[21]

- 17% of the national respondents had their heating disconnected or discontinued because of an inability to pay.
- 8% had their electricity (as opposed to heating) disconnected due to an inability to pay.
- 38% went without medical or dental care in order to have money to pay their home energy bill;
- 30% went without filling a prescription or taking the full dose of a prescribed medicine.
- 22% went without food for at least one day.

Low-income customers frequently have little incentive, and even fewer choices, to pursue constructive responses to their energy poverty. All too frequently, the customer is faced with an

[20] Apprise, Inc. (April 2005). National Energy Assistance Survey Report, National Energy Assistance Directors Association: Washington D.C. Similar survey studies, with similar results, have been published in 2003, 2008 and 2009, 2011, and 2018.

[21] LIHEAP is the Low-Income Home Energy Assistance Program, the federally-funded fuel assistance program in the United States.

immediate need (*e.g.*, bill payment by a date certain) with the available constructive responses to an inability-to-pay unable to deliver assistance either in the form, the time period, or the magnitude necessary to meet that need. Given the immediate consequences of failing to address the short-term nonpayment crisis, the customer is presented with a choice between untenable alternatives.[22]

i. Public Health Implications

The disconnection of electricity and/or natural gas service represents a distinct public health threat, particularly to aging households and to low-income households with children. The impact of service disconnections on the public's health and safety can hardly be debated in light of recent research. According to the 2005 NEADA survey, the loss (and threatened loss) of home heating service has significant health consequences to low-income households with children. NEADA found that survey respondents reported becoming ill because their home was too cold in the winter heating months. Nearly 1-in-6 of all energy assistance recipients reported that someone in the home became sick because the home was too cold in the past five years.

These illnesses were frequently severe enough to require medical treatment. In both 2003 and 2005, 11% of the surveyed energy assistance recipients reported that someone in the home had become ill enough to require going to a doctor or hospital because the home was too cold in the past five years.

A variety of reasons contribute to the overall rate of illness, as well as to the rate at which illnesses required medical treatment within the low-income energy assistance recipient population.[23] The primary contributing factor to the adverse health outcomes involves the tendency of low-income households to keep their homes at unsafe or unhealthy temperatures, given the unaffordability of home energy to the household. Of the households with children under age 18, between 20% and 25% kept their homes at "unsafe or unhealthy temperatures" because they did not have enough money to pay their home heating bills. Aside from households with children, the adverse health impacts of cold temperatures within a home are particularly acute for elderly households.[24]

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[22] *See*, Colton (1999). Measuring LIHEAP's Results: Responding to Home Energy Unaffordability, prepared for U.S. Department of Health and Human Services.

[23] *See generally*, Wilkins, *et al.* (2001). Cold Comfort: The Social and Environmental Determinants of Excess Winter Death in England 1986 – 1996. The Policy Press: Bristol; Maheswaran et al. (2004). Socio-economic deprivation and excess winter mortality and emergency hospital admissions in South Yorkshire Coalfields Health Action Zone, UK. Public Health 118. 167 – 176.

[24] Brennan, *et al.* (1982). Seasonal variation in arterial blood pressure, British Medical Journal. 285. 919 – 923; Wilkinson, *et al.* (2004). Vulnerability to winter mortality in elderly people in Britain: population based study. British Medical Journal 329. 647 – 652; Collins (1986). Low indoor temperatures and morbidity in the elderly. Age and Aging 15(4):212-20.

ii. Nutrition Implications

Unaffordable home energy has a substantial adverse impact on the nutrition of low-income households. According to the Congressionally-funded NEADA study, one-in-five low-income energy assistance recipients went without food for at least one day due to energy bills in the past five years. Renters experience food deprivation more frequently than do homeowners. While 10% of elderly homeowners went without food because of the need to pay home energy bills, 17% of elderly renters did. While 24% of non-elderly owners went without food due to energy bills, 28% of non-elderly renters did.

The impact of unaffordable home energy bills on nutrition was a phenomenon in all parts of the United States and across all climate regions. While the highest penetration of households going without food was in the West (31%), the existence of food deprivation attributable to the need to pay home energy bills was consistent throughout the remaining regions, including the Northeast (20%), Midwest (17%), and South (19%). There is no reason to believe, therefore, that the data presented in the NEADA survey is not transferable to Connecticut.

The conclusions of the NEADA survey are bolstered by significant academic research documenting a relationship between unaffordable home energy bills and nutritional deficiencies. One November 2006 article published in *Pediatrics*, the journal of the American Academy of Pediatrics, reports that "convergent evidence suggests that the periodic stress of home heating and cooling costs may adversely impact the health and nutritional status of children and other vulnerable populations."[25] According to this *Pediatrics* article, a study of children 6 to 24 months of age in Boston (MA) found higher proportions of children with weight-for-age below the 5th percentile in the three months after the coldest months, compared with all of the other months of the year.

The article reported further that:

> there is also evidence that hunger and food insecurity are associated with high utility costs and cold weather. In the United States, data show that families reporting unheated days or threats of utility turnoff are more likely to report that their children were hungry or at risk for hunger than families without either experience. In addition, national data collected from 1995 to 2001 as part of the Current Population Survey Food Security Supplement suggest that rates of food insecurity with hunger increased during the winter and early spring among low-

[25]Neault,, *et al.* (2006). Heat or Eat: Low Income Home Energy Assistance Program and Nutritional Risk among Children Under 3 Years Old. Pediatrics.

income families in areas with high winter heating costs and during summer in regions with high summer cooling costs.[26]

Other research on food insecurity has shown that food budgets are those most often sacrificed to meet other survival needs in low-income families.[27]

The nutrition threats are not limited simply to children. A November 2006 article in *The Journal of Nutrition* examined the association between household food insecurity and seasonally high heating and cooling costs for low-income elderly.[28] The study "examined the extent to which greater proportions of poor households, especially poor elderly households, experienced very low food security (the more severe range of food insecurity) during times of the year when home heating and cooling costs were high, controlling for important covariates." "Very low food security" is a severe range of food insecurity, which the U.S. Department of Agriculture referred to as "food insecurity with hunger" in its pre-2006 reports. The study found that "the odds of very low food security were 27% higher in the summer than in the winter in a high-cooling state. In a high-heating state, the odds of very low food security were 43% lower in the summer than in the winter. . ."

The study found that there was a direct relationship between unaffordable home energy bills and the nutrition deficiencies that were documented. It concluded that "the association of interest appears, therefore, to represent a causal effect of home heating and cooling costs and not to be a spurious artifact caused by other seasonally variable economic factors. If anything, the effects of seasonally high home heating and cooling costs on food insecurity may be somewhat ameliorated by seasonal differences in economic factors." The authors concluded that "our analysis shows that in high-heating states, households with incomes below the poverty line were substantially more vulnerable to very low food security during the winter than during the summer, whereas the opposite was true in high-cooling states."

[26] Heat or Eat, *supra*.

[27] *See generally*, Frank, Roos, Meyers, *et al*., Seasonal variation in weight-for-age in a pediatric emergency room. Public Health Reports, 1996; 111:366-371; Bhattacharya, DeLeire, and Currie. Heat or eat? Cold-weather shocks and nutrition in poor American families. Am. J. Public Health. 2003; 93:1149-1154; Frank, *et al.* (2006). Unhealthy Consequences: Energy Costs and Child Health: A Child Health Impact Assessment of Energy Costs and the Low-Income Home Energy Assistance Program, Child Health Impact Working Group: Boston Medical Center: Boston (MA); Colton (2008). Public Health Outcomes Associated with Energy Poverty: An Analysis of 2007 Behavioral Risk Factor Surveillance System (BRFSS) Data from Iowa, Iowa Department of Human Rights: Des Moines (IA).

[28] Nord and Kantor. Seasonal Variation in Food Insecurity is Associated with Heating and Cooling Costs Among Low-Income Elderly Americans. Journal of Nutrition. 2006; 136:2939-2944.

iii. Public Safety Implications

In addition to these public health and nutrition issues, the unaffordability of home heating service represents a distinct public ***safety*** threat as well. According to the Canadian Housing and Rental Association, energy poverty can cause households to turn to unsafe heating practices, including heating their home with an open oven door or faulty electric heater. Supplemental heaters cause 120,000 residential fires and 600 deaths annually in the United States.[29]

The loss of ***electric*** service (not merely heating service) poses a particular threat to the health and safety of low-income Connecticut households with children. The home electric service that is being disconnected to low-income households is frequently essential to the operation of some medically-necessary equipment in the home. A full 25% of all energy assistance recipients surveyed for the NEADA study, which had children under the age of 18, reported that a member of the household used medical equipment that requires electricity. A full 6% of all energy assistance recipients surveyed by NEADA reported that the equipment using electricity was used to treat asthma. Nearly as many (4%) said that someone in the household was taking medication that required refrigeration.

The move to auxiliary heating sources when primary heating fuels are disconnected opens up the possibility of an associated fire risk for low-income households. While home heating equipment is no longer the ***single*** most substantial cause of home fires,[30] it remains ***one*** of the leading factors contributing to fires, as well as to fire-related injuries and deaths. In particular, portable and fixed space heaters present a risk of harm. While portable space heaters are not the major cause of home heating fires, they play a much more substantial role in deaths and injuries. Portable and fixed space heaters (and their related equipment such as fireplaces, chimneys and chimney collectors) accounted for roughly two of every three (65%) home heating fires in 1998 and three of every four (76%) associated deaths.[31] Each of these devices has a higher death rate per million households using them than do the various types of central heating units or water heaters.

The National Fire Protection Association (NFPA) reports data confirming these data and conclusions. According to the NFPA, "not being able to afford utilities" is one of the "major factors of increased fire risks" for low-income households. "In poor homes, small portable

[29] Canadian Housing and Rental Association (February 2005). Affordable & Efficient: Towards a National Energy Efficiency Strategy for Low-Income Canadians.

[30] The term "`homes' refers to one- and two-family dwellings (which includes manufactured homes) and apartments. . ." The share of fires involving heating equipment, the National Fire Prevention Association (NFPA) says, "is quite different for the two types of homes." While heating equipment is the second leading cause of fires in one- and two-family dwellings, it was only the seventh highest cause of fires in apartments.

[31] Ahrens (June 2001). The U.S. Fire Problem Overview Report: Leading Causes and Other Patterns and Trends, at 55, National Fire Protection Association: Quincy (MA).

heaters or space heaters may be used to heat areas much too large for their capacity, and some households supplement heating equipment by turning on their ovens and leaving the door open."[32]

iv. Summary

The unaffordability of home energy facing low-income Connecticut residents has severe social, economic, and business consequences that ramify throughout all sectors of the state. From a social perspective, unaffordable home energy not only threatens the ability of low-income customers to maintain access to their utility service, but also imposes a range of adverse consequences threatening the health, housing, and general welfare of those households. The paid-but-unaffordable home energy bill is a real phenomenon in Connecticut. Paying an unaffordable home energy bill means that low-income Connecticut residents will go without food, medical care, and other life necessities.

Overall, however, home energy unaffordability generates harms beyond those societal harms. Unaffordable home energy has an adverse impact not only on low-income households, but also on Connecticut as the local utility serving those households and on the Connecticut community generally. An inability-to-pay from the perspective of the customer is an inability-to-collect from the perspective of the utility.

[32] "Burning Issues," NFPA Journal, at 104 (January/February 1996).

Part 2. The Utility Benefits of Addressing Inability-to-Pay.

As described in more detail above, establishing the foundation for implementation of a low-income affordability program for utility customers must be built on the objective(s) the program is seeking to accomplish. Any assessment of benefits arising from an income-based program should not only articulate the outcomes the program seeks to accomplish, but should also measure the effectiveness of the program in achieving those outcomes. In addition, the measurement of effectiveness should be compared to a measurement of the effectiveness of the status quo, or of other alternatives, in achieving those same outcomes.

For purposes of this section, the objectives of a low-income affordability program are limited to those objectives that are exclusively related to the utility as a utility. Without endorsing the notion that any social function is beyond the purview of ratepayer dollars –utilities certainly spend money on such "social" functions as workplace safety, environmental protection (including clean air and water), and workplace diversity—for the purposes of the instant analysis, the social function of providing affordable rates because of the social benefits generated by affordability (*e.g.*, housing, public health and safety, nutrition, business competitiveness) is set aside for the moment.

A. ACHIEVING DIRECT BUSINESS OUTCOMES.

The foundation for a low-income program affordability program must consider the effectiveness of the program in accomplishing the articulated outcomes. No matter what level of cost is being

incurred, by the program or by the alternatives against which the program is being compared, to the extent that the business objectives are *not* being accomplished, a compelling case cannot be made for that activity. With this in mind, assessing a low-income program first considers whether the identified desired outcomes are being accomplished.

i. The Overall Payment Benefits.

There are at least the following expected utility-related, payment-related outcomes that would be generated by a low-income bill affordability program for Connecticut:

Increased Bill Payment Coverage: The first impact of a bill affordability program in Connecticut would be an increase in the bill payment coverage ratio of participating low-income consumers. The bill payment coverage ratio is the percentage of billed revenue actually paid by the customer. A customer who pays $90 of a $100 bill, for example, has a bill payment coverage ratio of 90%. Having a bill payment coverage ratio of more than 100% means the customer is not only paying his/her current bill, but is also retiring pre-existing arrears. Having a bill payment coverage ratio of less than 100% means that the customer is not paying the current bill, but is instead incurring additional arrears.

In contrast to the poor baseline performance currently existing for low-income customers, as documented above, states adopting bill affordability programs see a dramatic improvement in the bill payment coverage ratios of their low-income customers. Consider, for example, the Apprise, Inc. evaluation of the New Jersey Universal Service Fund. That Apprise report shows the following for gas or electric customers (target affordable bill burden of 3%):

Table 3. Distribution of Effective Coverage Rate by Net Energy Burden (gas or electric: 3%)

	Coverage Rate			
Burden	< 50%	50% - <90%	90% - <100%	100% or more
<2%	0.0%	2.7%	5.3%	92.0%
2% - 3%	0.0%	6.0%	11.5%	82.5%
3% - 4%	0.0%	10.0%	13.2%	76.9%
4% - 6%	0.0%	11.6%	16.6%	71.6%
6% - 8%	0.4%	16.6%	17.4%	65.6%
More than 8%	1.0%	25.6%	16.1%	57.4%

As can be seen in the Table above, so long as the bill burden remained in the target range in New Jersey, from 94% (11.5% + 82.5%) to 97% (5.3% + 92.0%) of the low-income customers generated a bill payment coverage ratio of 90% or more. Indeed, between 83% and 92% of low-income program participants had a bill payment coverage ratio of 100% or more.

These 90%-plus payment coverage rates stand in sharp contrast to the existing payment compliance for low-income residential customers at existing burdens. Customers with burdens of more than 8% paid 90% or more of their bill only 73% of the time (16.1% + 57.4%). Indeed with burdens of 8% or more from four to eight times more low-income customers paid as little as 50% of their bills.

Similar results have arisen from the Pennsylvania low-income affordability programs as well. Each year, the Pennsylvania PUC's Bureau of Consumer Services ("BCS") collects and reports data on the performance of that state's "universal service" programs. The data collection allows policy-makers and utility service providers to compare the performance of low-income residential customers participating in the low-income bill affordability programs of Pennsylvania utilities (called Customer Assistance Programs, or "CAPs") to the performance of "confirmed low-income" customers in general. In 2019, Pennsylvania utilities had 1.075 million "confirmed" low-income customer accounts statewide.[33] The confirmed low-income accounts were heavily payment-troubled. More than 13% percent of these confirmed low-income customers had been disconnected for nonpayment in 2019, of which only 78% were reconnected. More than 22% of all confirmed low-income accounts were in debt, with those confirmed low-income customers having an average monthly arrears of $590.

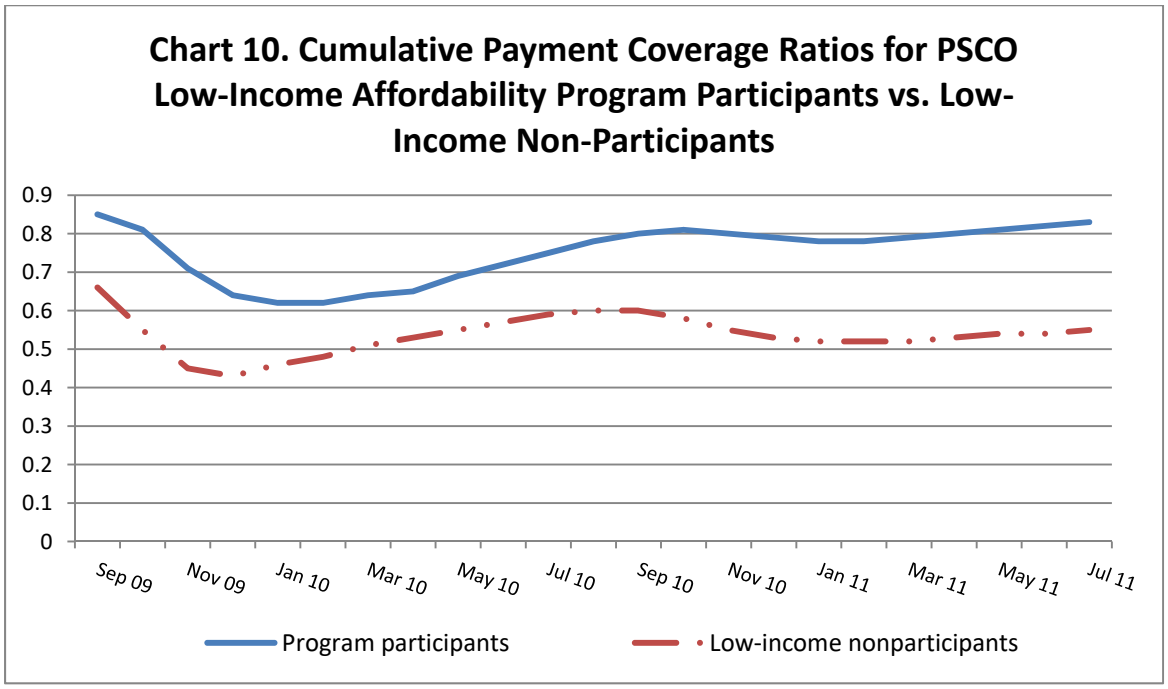
In contrast to these payment difficulties for confirmed low-income customers, the participants in the low-income CAP programs(Pennsylvania's low-income affordability program) had an average payment coverage ratio of 86%. Through their affordability programs, in other words, Pennsylvania's utilities took extremely payment-troubled confirmed low-income customers and structured a response where the utilities were receiving nearly $9 of every $10 billed.

Public Service Company of Colorado ("PSCO") also experienced a dramatic increase in the payment coverage of its low-income program participants. The impact of the Colorado low-income program can be seen in the graph of payment coverage ratios (*i.e.*, customer payments / billed revenue = payment coverage ratio) presented immediately below. PSCO's bill affordability program participants substantially out-performed those PSCO low-income customers who received LIHEAP –called "LEAP" in Colorado--[34] but who did not participate in the bill affordability program.

[33] Pennsylvania utilities had an estimated 1,938,745 number of low-income customer accounts. Accordingly, the utilities had "confirmed" roughly 55% of their estimated number of low-income accounts. Given that these numbers include both gas and electric utilities, however, it cannot be concluded that these numbers reflect "households." Some accounts may be counted twice, once by the electric utility and again by the natural gas utility.

[34] Both "LIHEAP" (Low-Income Home Energy Assistance Program) and "LEAP" (Low-income Energy Assistance Program) refer to the federal energy assistance program in the United States.

As can be seen in the Figure below, by the end of the program pilot, the payment coverage ratio of participants in PSCO's low-income bill affordability program (83%) was nearly 30% higher than the payment coverage ratio of low-income customers *not* participating in the program (55%). Moreover, the cumulative payment coverage ratio of program participants was increasing throughout the term of the pilot. PSCO has since expanded its program to a full-blown low-income affordability program.



A universal finding of programs offering affordable bills has been that low-income customers increase their payment coverage ratios. In contrast to the ongoing and substantial nonpayment problems faced by low-income customers generally, rate affordability participants tend to pay their bills.

Increased "Net Back": A not-surprising corollary to the increased bill payment coverage ratio of bill affordability program participants is an increase in the "net back" experienced by the utilities offering affordable low-income rates. Stated conceptually, it is better for a utility to collect 90% of a $70 bill ($70 x 0.90 = $63) than it is for that utility to collect 60% of a $100 bill ($100 x 0.60 = $60). Under an affordable bill plan, in other words, even though a portion of the bill is discounted, the extent to which payments increase is such that *total revenue* goes up. This increase in revenue is accompanied by a decrease in the cost of collecting that revenue.

Outside of the utility industry, "net back" is a common metric in measuring the cost-effectiveness of collecting revenue. One collection professional described "net back" as follows:

> The second and most important way to determine the true value of a collection agency is to calculate its Net Back figure and compare it with those of other collection agencies. Collection agencies charge for their services in different ways, but the end result is usually a single fixed rate or a variable contingency rate that is charged as a percentage of recoveries: a commission.
>
> Because some collection agencies are more effective than others, the rate of recovery must also be considered in determining the true value. When you consider both an agency's commission rate and its recovery rate, you can arrive at a figure for comparison, the Net Back figure.[35]

The "net back" criterion focuses on whether a utility offering affordable bills experiences an increase in net revenues if customer bills are paid in a more complete fashion as a result of the affordable bill. While generally viewed as a measure of cost-effectiveness, in fact, "net back" combines "effectiveness" and "cost-effectiveness" into one comprehensive evaluation criterion. It provides not only a measurement of the effectiveness of the low-income programs (through the "payment coverage ratio" measure), it also provides a measurement of the cost of the program. By combining the two measurements into one criterion, "net back" provides for a balancing of both factors (effectiveness of the programs on the one hand and costs of the programs on the other hand).

An increased "net back" has been found for both the Colorado and Indiana low-income bill affordability programs. In assessing the impact of improved customer payment performance on total revenue, the Colorado evaluation reported that the PSCO program "generated a revenue neutrality when PEAP participants were compared to other low-income customers, but not when compared to the residential population as a whole." It went on to say:

> The lesson learned from [the PSCO data] is that PEAP generates a sufficiently substantial improvement in payment coverage ratios relative to the low-income (nonparticipant) population to more than offset the discount provided. To the extent that the low-income customers have a prior history of non-payment, the revenue neutrality will be somewhat (but not substantially) greater. However, because the payment coverage ratios of the residential population as a whole are higher with which to begin, the revenue that is being "lost" to nonpayment in the

[35] Statewide Credit Association, Inc. (January 12, 2012). http://www.statewidecredit.net/ProductsServices/TheNetBackConcept/tabid/87/Default.aspx

> absence of the discount is smaller, and the increase in payment coverage ratios is insufficiently large to offset the effects of the discount.[36]

The same results were found for Indiana's low-income programs. A 2007 evaluation of the Citizen Gas and Coke Utility ("CGCU") low-income program (called, the Universal Service Program or "USP") found:[37]

> Customers that participated in the Citizens Gas USP made substantively greater payments than did that company's nonparticipant population. Over the months of January through March 2007, USP participants paid 79% of their current utility bill. While billed $273,627 during those winter months, the USP participants paid $215,897. In contrast, the Citizen Gas *non*participants paid only 64% of their January through March billings. While billed $304,072, these customers paid $194,577. As can be seen, the USP was better than revenue neutral to Citizens Gas. While USP participants were billed 90% of what nonparticipants were billed, they paid 111% what nonparticipants paid.[38]

As in the Colorado program, in other words, in Indiana, the increased payment performance was more than sufficient to offset the billing discount. As with the Colorado program, the Indiana program generated revenue neutrality. Revenue neutrality examines the extent to which, if at all, a low-income rate affordability program generates the same dollars of revenues to the utility despite the offer of discounted rates or bills. Revenue neutrality occurs when the discounted rates or bills improve payment patterns sufficiently to offset any reduced billings through the offer of the rate discount. The Table below presents the results:

[36] Colton (2012). Public Service Company of Colorado's (PSCo) Pilot Energy Assistance Program (PEAP) and Electric Assistance Program (EAP): 2011 Final Evaluation Report, prepared for Public Service Company of Colorado: Denver (CO).

[37] All dollar figures presented in this analysis, unless other explicitly noted to the contrary, are associated with the sample population and not the total population.

[38] Colton (2007). An Outcome Evaluation of Indiana's Low-Income Bill affordability programs, prepared for Citizens Gas and Coke Utility, Vectren Energy, and Northern Indiana Public Service Company.

Table 4. Billings and Revenues Under CGCU Rate Affordability Program

Population	Billed Revenue	Collected Revenue ($s)	Collected Revenue (%)
Program participants	$273,627	$215,897	79%
Program non-participants	$304,072	$194,577	64%
Ratio: participant : nonparticipant	0.90	1.11	--

NOTES: Based on study sample.

Revenue neutrality for the rate affordability program by Vectren in Indiana also was measured by comparing low-income program participants to customers known to be low-income but not participating in the rate affordability program. One impact of the rate affordability program was to significantly increase the rate at which low-income customers paid their Vectren bills. Customers that participated in the Vectren program paid 82% of their Vectren bill, compared to a payment of 50% for Vectren low-income non-participants.

Overall, as a result of an affordable bill program directed toward low-income customers, Connecticut utilities could very possibly be expected to collect more money despite offering a discounted rate.

ii. Payments Yielding $0 Balances.

Ultimately, the outcome that Connecticut utilities seek from their customers is a payment that results in a $0 balance. That outcome has been examined from a variety of perspectives elsewhere throughout the discussion above (*e.g.*, the payment coverage ratio). The discussion below, however, examines the impact of an affordable bill program on the ***regularity*** with which "complete" bill payment occurs. The regularity of complete bill payment is examined below from two perspectives:

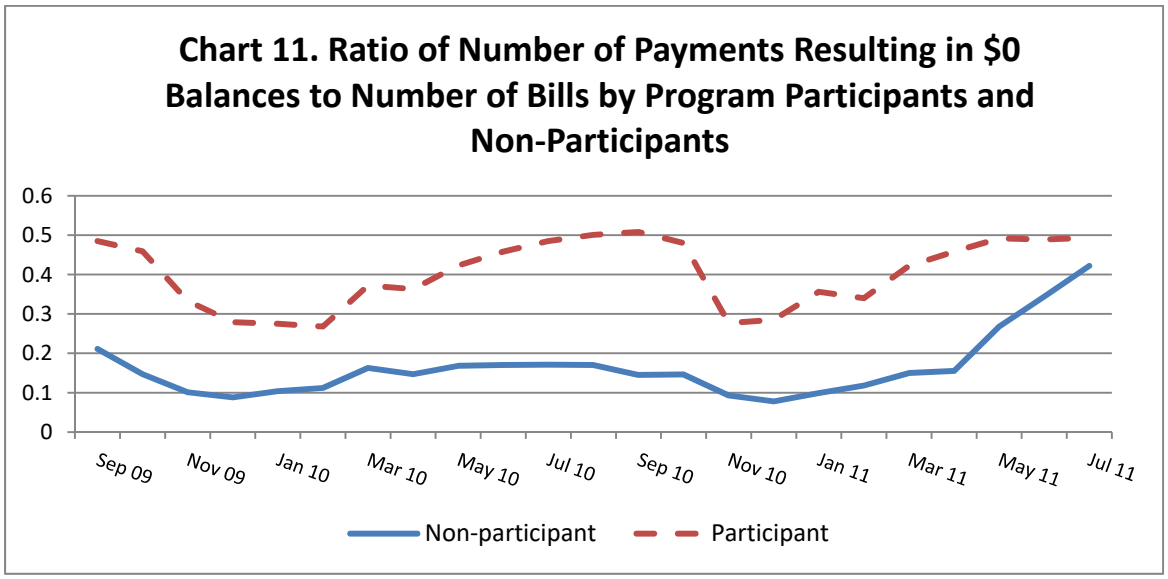
- On the one hand, the discussion considers the extent to which complete bill payments are made as a proportion of the number of bills rendered.

- On the other hand, the discussion considers the extent to which complete bill payments are made as a proportion of the number of payments that are made.

While a utility would prefer to have customers make bill payments that result in a $0 balance in response to each bill (*i.e.*, a ratio of 1.0), a customer that exhibits a higher proportion of payments resulting in $0 balances of the payments that are made nonetheless still exhibits a

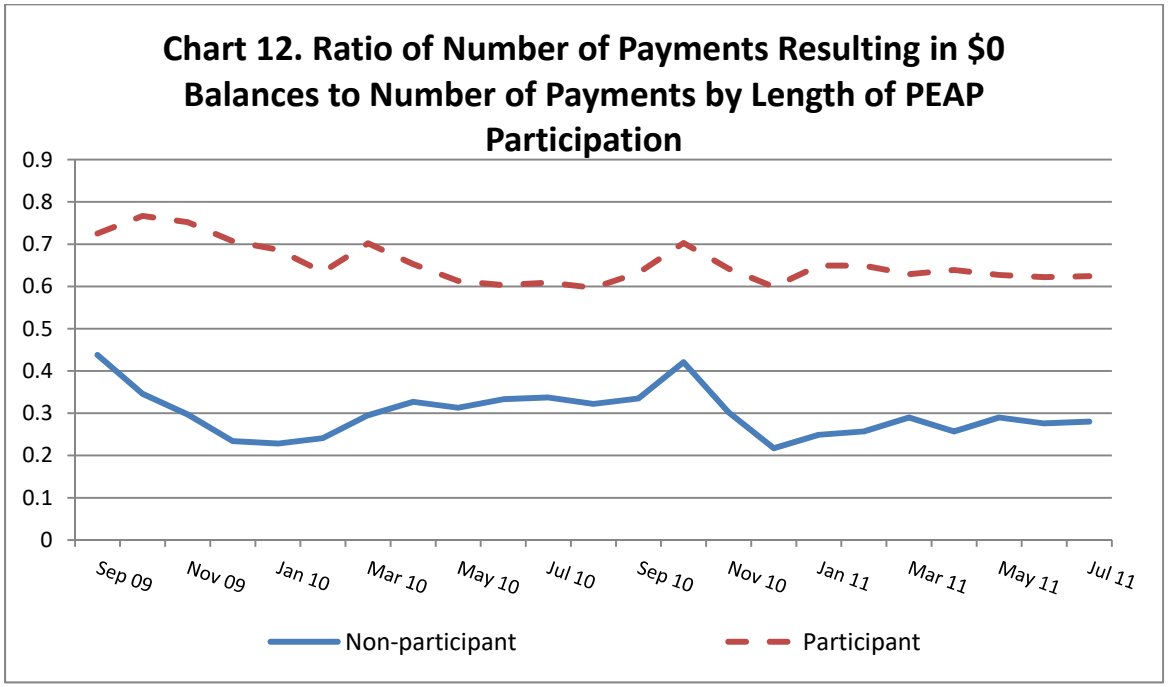
better performance than a customer that makes a lower proportion of payments that result in a $0 balance.

An affordable bill for Connecticut utilities can be expected to improve the incidence at which participating low-income customers make complete bill payments (*i.e.*, a payment yielding a $0 balance). In Colorado, PSCO's program participants out-performed non-participants in the proportion of bills that are met with payments that result in a $0 balance. The Figure below presents the data. The data in this Figure involves monthly (not cumulative) data. Most significantly as can be seen from this data, the extent to which program participants out-perform program non-participants is notable. While 50% or more of warm-weather bills resulted in a $0 balance for the participant population, fewer than 20% of the warm-weather bills resulted in a complete retirement of outstanding balances for the non-participant population. Even with an influx of "crisis" assistance in the Spring of 2011, the proportion of non-participants making complete bill payments falls well short of program participants.[39]



The Chart below shows that when PSCO's program participants ***did*** make payments, they tended to make payments sufficient to retire their entire balances. While these customers tend to make payments retiring their entire balance in response to 50% or less of the bills that are rendered, they also tend to make payments retiring their entire outstanding balance in between 60% and 70% of all the payments that they do make. In contrast, while the program non-participants tended to make payments retiring all outstanding balances in response to between 10% and 20% of bills they receive, they also tended to make payments retiring their entire outstanding balance in only 20% to 30% of the payments that they made.

[39] Remember, the option to making a payment resulting in a $0 balance is not to make no payment. A customer may make a partial payment.



Again, it is important to understand what this data does and does not show. A customer paying 95% of his or her bill would not be a complete payment (*i.e.*, yielding a $0 balance). In addition to the customers making a payment yielding a $0 balance, in other words, there are likely additional customers making substantial, even if not complete, payments.

iii. Increased Efficiency / Productivity of Collection Efforts.

In addition to assessing the effectiveness of a low-income program in accomplishing desired business outcomes (relative to the alternatives), it is necessary to judge the productivity of the program (*i.e.*, the efficient use of company resources) in accomplishing the desired outcomes. A bill affordability program offered by Connecticut utilities can be expected to increase the productivity of utility collection efforts directed toward low-income customers.

Addressing the productivity of utility efforts helps the utility assess whether there is a proper match between the tool being employed and the type of payment problem that is sought to be remedied. On the one hand, evaluating the productivity of the program (relative to its alternatives) helps to identify when inappropriately extensive tools are being employed by the utility. An involuntary disconnection of service, for example, is not a collection tool that addresses temporary inability-to-pay. The bill would be paid whether or not the disconnection was employed. In these circumstances, the disconnection serves no business purpose. It is not "productive," in that it generates no additional revenue.

On the other hand, evaluating productivity will help Connecticut utilities evaluate whether they are using a tool that is insufficient given the types of problems extent on the utility's system. Considering productivity, in other words, helps identify when tools are being employed that have no hope for success. A deferred payment plan, for example, is not a tool that addresses chronic inability-to-pay. If a customer could not pay his or her full bill in the past because of a lack of money, it lacks good sense to use a tool that would require that customer to pay the full bill ***plus*** some increment to retire arrears in the future. In these circumstances, the tool is likely to be unsuccessful. It is not "productive," in that it generates no additional revenue.

The amount of collection effort needed: Productivity implies not only some absolute level of output (*i.e.*, "effectiveness") but some level of output given a designated level of input as well.[40] In order to evaluate productivity, both the input and the output data are needed. Improvements in the productivity of collection activities can occur in either of two ways:

- The need for collection interventions can be reduced thus allowing an increased payment per each collection intervention performed. In this first instance, improvement can be seen even if total dollars collected remains the same (but the number of interventions needed to generate those dollars decreases); or

- The customer response to the collection activity can improve thus allowing an increased payment per each collection intervention performed. In this second instance, improvement can be seen if the total number of collections activities remains the same (but the amount of dollars generated by those activities increases).

The metrics used to measure collection efficiency and productivity are two-fold:

- The number of each collection activity per 1,000 customer payments (measured in number of payments without regard to the size of each individual payment); and

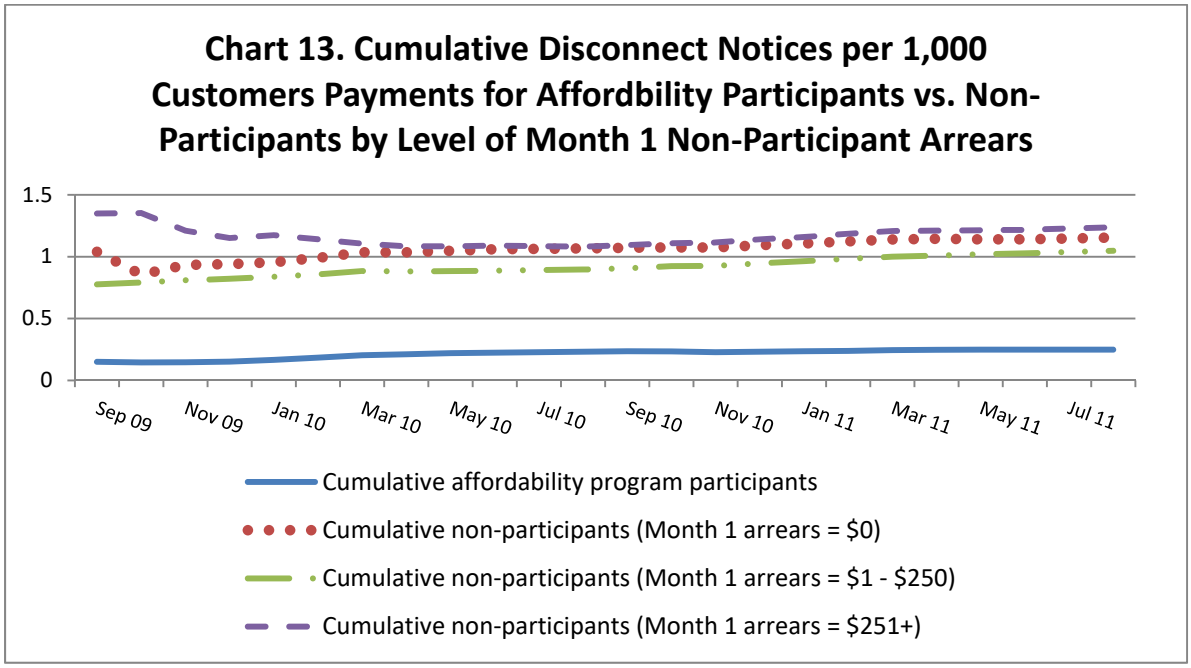
- The number of each collection activity per $1,000 in customer payments (measured in dollars of payments made).

[40] If one were to compare the effectiveness of two district offices in collecting bills, the absolute amount of revenue collected would not be the exclusive performance factor to use in the comparison. Even assuming that both offices faced identical numbers of payment-troubled customers with identical payment problems, it would be invalid to say ipso facto that one office was more "productive" if it collected 10% more revenue. If the office which collects more had twice the staff, but collected only 10% more revenue, the revenue collection per staff member would be much lower. If the office that collected more had a substantially greater investment in equipment (*e.g.*, auto-dialers), but collected only 10% more revenue, the revenue collection per dollar of capital investment would be much lower.

Efficiency is measured as the ratio of the effort expended to the outcomes generated. In both instances above, a lower number is "better" than a higher number.[41] A "lower number is better" because the denominator (either the number of payments or the dollars of payments) increases while the numerator (the number of collection interventions) stays the same. a "lower number is better," also, because the denominator stays the same but the numerator decreases. Other variations of the ratio can also exist.

The evaluation of PSCO's affordable bill program found that the collection activities that PSCO directed toward program participants were more productive at generating payments than the collection activities directed toward program non-participants. As shown in the Figure below, PSCO needed to engage in from three to five times more collection activities for each 1,000 customer payments it received from non-participants.[42]

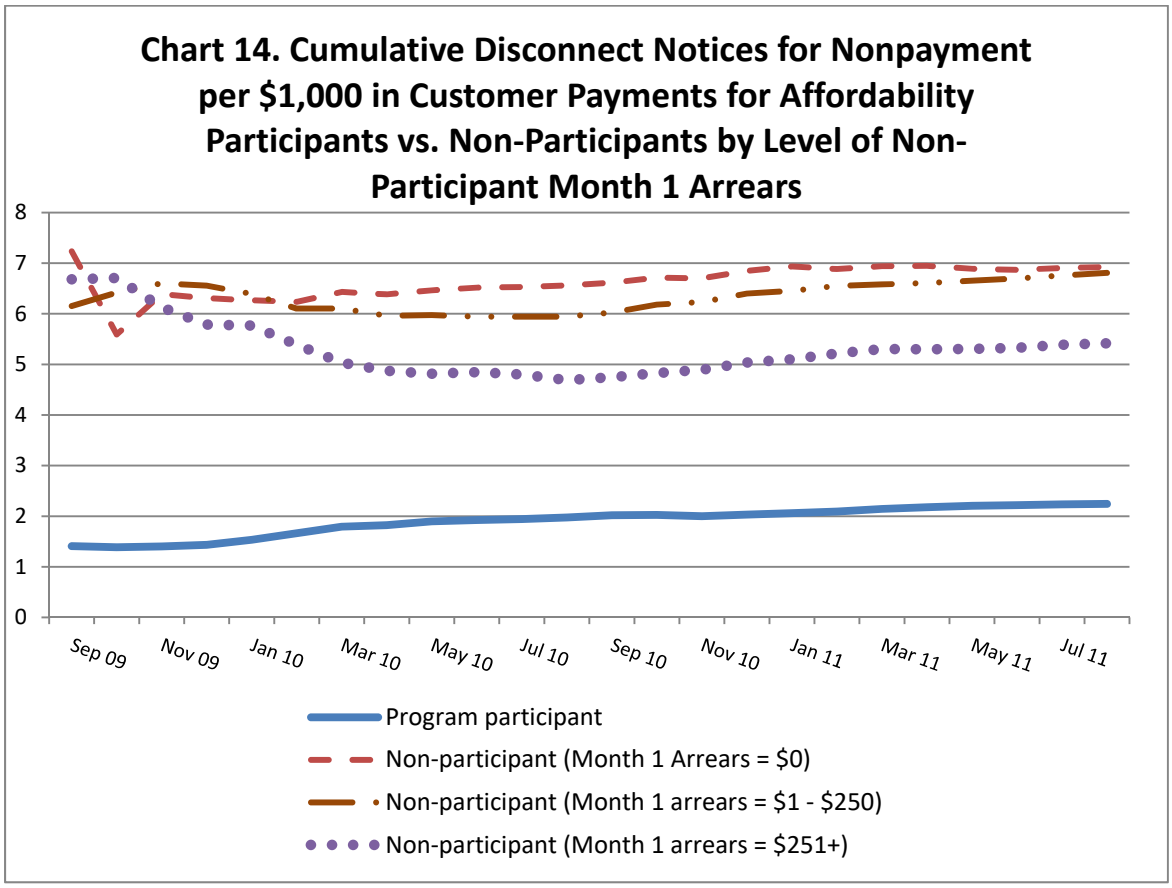
The non-participant population was disaggregated by the level of Month 1 arrears to determine whether prior nonpayment made a difference in the result. As can be seen, it did not. The participant population out-performed the nonparticipant population irrespective of the prior payment arrearages of the non-participants.



[41] Engaging in four collection actions per each $1,000 in payments is "better" than engaging in seven collection activities per each $1,000 in payments.

[42] As discussed in more detail above, this result might occur for one of two reasons. On the one hand, more PEAP participants might make payments without need of any disconnect notices being issued. On the other hand, more PEAP participants might respond to the receipt of a disconnect notice by making payments.

The results were the same when collections productivity was viewed in terms of dollars of payments rather than in terms of numbers of payments. In Colorado, participation in the affordable bill program reduced the reliance on disconnect notices as a collection activity. While program participants required between one (1) and two (2) disconnect notices for each $1,000 in customer payments, non-participants required between five (5) and seven (7). Again, the existence of pre-existing nonpayment by the non-participant population did not affect the conclusions drawn about the difference between the participant and non-participant populations.



In sum, based on both measures of productivity, overall, not only did PSCO collect more revenue from its affordability program participants (as discussed above), but the utility was required to engage in fewer collection activities to generate those payments.

The Intensity of Collection Effort Needed: The productivity of collection efforts can be measured not merely by the number of collection effort required to generate a certain number of payments, or a certain number of dollars of payments (as discussed above), but can be measured through an examination of the *intensity* of collection effort required as well. For example, the use of a rate affordability program helped Indiana utilities enhance the productivity of their collection efforts. Vectren Energy's rate affordability program allowed that company to move to an increased reliance on payment plans as a collection device for its low-income program participants rather than

relying on the disconnection of service for nonpayment when low-income customers fell into arrears. The Table below shows that that while the payment plan-to-disconnect ratios are similar for all customers and for low-income customers in the early study months, as the company implemented its rate affordability program, it consistently moved to a greater reliance on payment plans rather than on service disconnections to respond to low-income arrears. In the pre-winter month of November, the ratios of payment plans to service disconnections for nonpayment were virtually identical.[43] The data is disaggregated by the three "tiers" of the rate affordability program (called USP, "Universal Service Program").[44]

- In April, while USP3 customers had 11.1 payment plans for each disconnection for nonpayment, the residential customer base as a whole had only 2.7 payment plans;

- In May, while USP1 customers had 6.9 payment plans for each disconnection, the residential customer base as a whole had only 1.6 payment plans.

Table 5. Ratio of Deferred Payment Arrangements to Disconnections for Nonpayment: Pre- and Post-Winter Heating Season: 2006/2007 (Vectren) /a/

	Nov 2006	April 2007	May 2007
All residential	3.1	2.7	1.6
USP 1	4.4	9.1	7.7
USP 2	3.7	12.1	8.2
USP 3	2.8	11.1	6.9

NOTES:

/a/ Winter months not considered given Indiana's winter shutoff moratorium.

The ability to treat the arrears of its low-income customers in a less intensive fashion is also evident from an examination of the ratio of field collections to the number of other collection activities. The Table below presents data on the ratio of field collection activities to mail collection activities. If the ratio is 1.0, there is one field collection activity for every 100 mail collection activities. If the ratio is 3.0, there are three field collection activities for every 100 mail collection activities. A

[43] The Table presents ratios. A ratio of 1.0 means that for every disconnection of service for nonpayment, there is an account on a deferred payment plan. If there were 100 disconnections for nonpayment, in other words, there were also 100 accounts on payment plans. A ratio of 3.0 means that for every one account subject to disconnection, there were three accounts on a deferred payment plan.

[44] The Tiered Rate Discount has three tiers to the Discount. "USP1" includes the low-income program participants in the highest income tier; "USP3" includes the low-income customers in the lowest income tier. "USP" represents Universal Service Program, the name of the Tiered Rate Discount.

higher ratio evidences a greater reliance on the more intensive (and more expensive) field collection activities.

Table 6. Ratio of Field Collection Activities to 100 Mail Collection Activities: Pre- and Post-Winter Heating Season: 2006/2007 (Vectren) /a/

	Nov 2006	April 2007	May 2007
All residential	4.7	6.7	10.0
USP 1	5.3	3.1	3.8
USP 2	7.8	2.4	2.9
USP 3	8.9	2.7	4.2

NOTES:

/a/ Winter months not considered given Indiana's winter shutoff moratorium.

The Vectren rate affordability program allowed the utility to move to a less intensive collection activity directed toward its low-income customers when compared to its residential customer base as a whole. In the pre-winter/pre-program month of November, the ratio of field collection activities per 100 mail collection activities was similar between the low-income population and the residential population as a whole. If anything, the intensity of collection effort was greater for a significant portion of the low-income population (USP2 and USP3), with noticeably more field collection activities per 100 mail collection activities than for the residential customer base as a whole.

After operating its rate affordability program, however, Vectren could collect its low-income revenue with less intensive collection activities. Contrary to the pre-program results, after the company implemented its rate affordability program for low-income customers, the company was exerting between two and three times more field collection activities (per 100 mail collection activities) for its residential customer base as a whole than it was for its low-income population.[45]

iv. Long-Term Success of Collection Efforts.

By addressing the underlying inability-to-pay, a low-income bill affordability program can be expected to increase not only the productivity of collection efforts, but it can also be expected to increase the long-term success of collection efforts as well. It would be unreasonable to expect a

[45] These results are consistent with the "theory" of a low-income program. A low-income program will not likely result in an absolute decrease in the number of collection activities. Instead, a low-income program allows a utility to switch its commitment of collection resources away from low-income customers, where the collection activity is not likely to be effective, to non-low-income customers where the activity is more likely to have a positive effect on revenue collection.

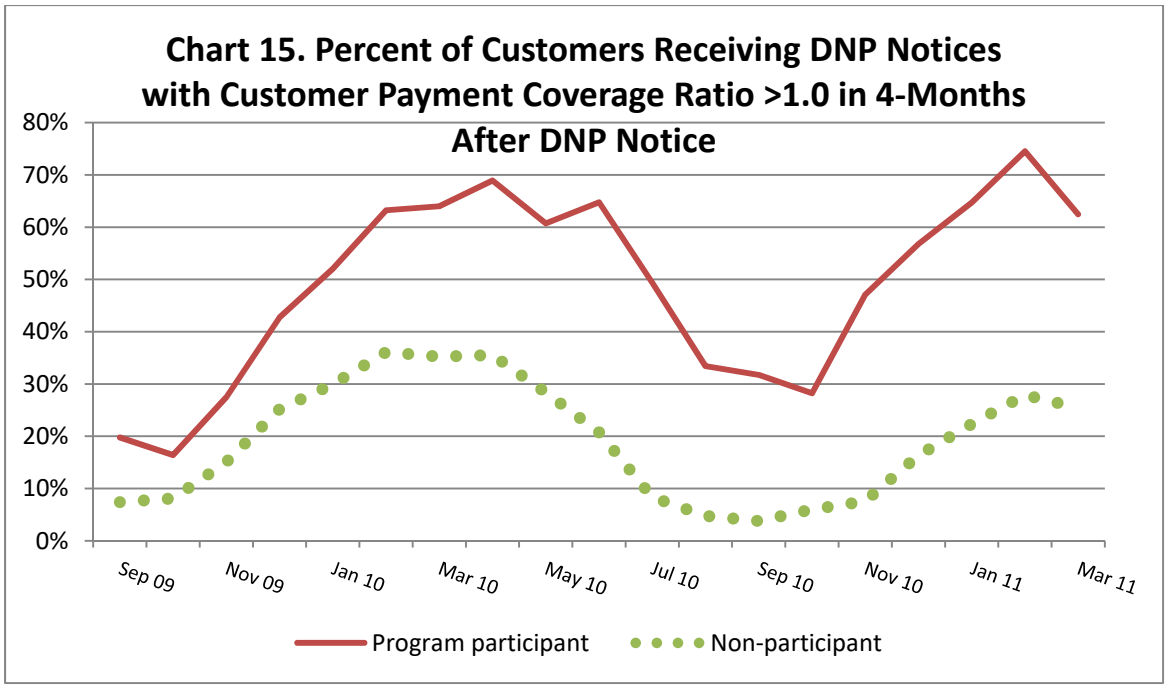
low-income affordable bill program to ***totally*** eliminate the need for ***all*** collections efforts directed toward program participants. Even non-low-income residential customers have some collection effort directed toward them. However, an affordable bill can be expected to help increase the success of those collection efforts that ***are*** required.

In this regard, a "successful" (or "effective") collection activity is measured not merely by the extent to which customers make payments in the month in which the collection activity occurs, but also over a period of time immediately subsequent to that collection activity. A collection activity that generates a payment in the month of the activity, only to see the customer fall back into a pattern of nonpayment in the immediately subsequent months, is less "effective" (or "successful") than a collection activity that generates a series of more timely (or more complete) payments over a period of months.

The PSCO program evaluation measured the success of collection efforts for low-income customers participating in the company's affordable bill program as compared to the success of collection efforts directed toward low-income customers ***not*** participating in the bill affordability program. The data examined the percentage of accounts receiving disconnect notices that have a customer payment coverage ratio of more than 1.0 in the ensuing four months. As with the payment coverage ratio discussed above, in this inquiry, a higher number is "more effective" while a lower number is "less effective." A higher number indicates that more accounts having received a disconnect notice made payments equal to a higher proportion of their bill for current usage in the four months immediately following receipt of a disconnect notice.

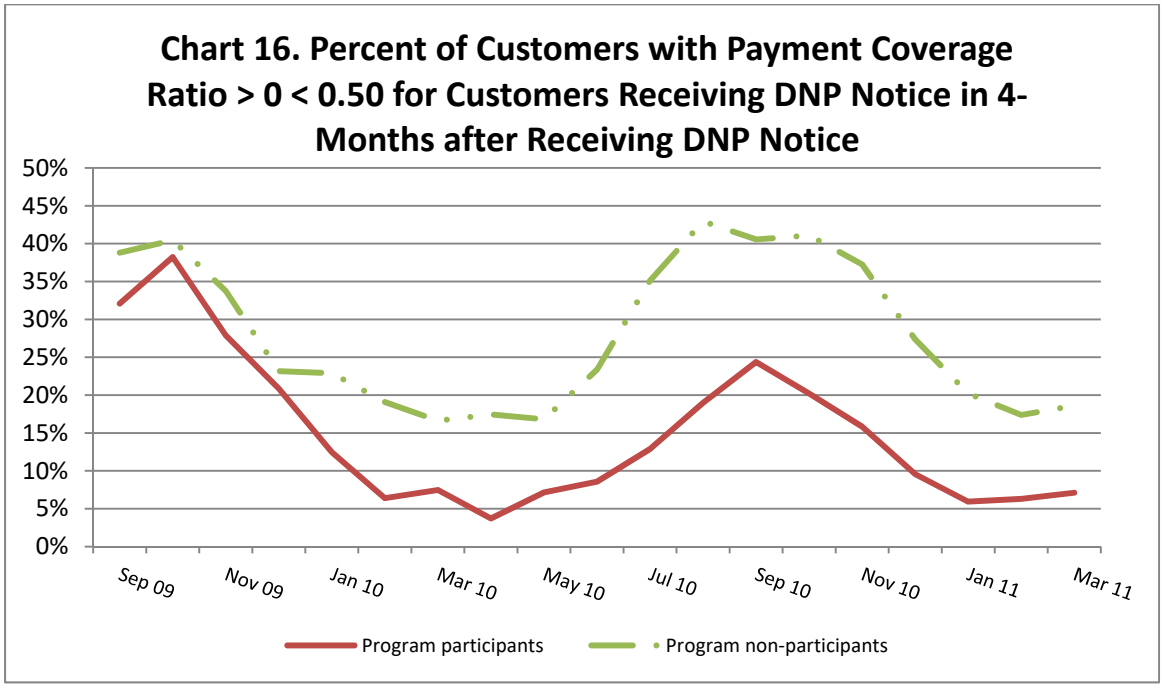
The data presented in the Chart below examines the proportion of customers having received a disconnect nonpayment ("DNP") notice who made payments equal to or more than 100% of their current bill. The percentage of program participants with a payment coverage ratio of more than 1.0 is consistently higher than the proportion of non-participants doing so. A payment coverage ratio of greater than 1.0 means that the customer is paying more than his/her bill for current usage. That customer, in other words, is completely paying his/her bill for current usage and making some payment toward the arrears that was the reason for issuing the disconnect notice in the first instance.

As can be seen in this Chart, the payment performance for participants in the low-income program improved over time, while the payment performance of low-income customers ***not*** participating in the low-income program did not. In this Figure, the population is limited to customers who received a disconnect notice for nonpayment. The payment coverage ratio examined the ratio of dollars of payments made in the four months after receiving a disconnect notice to the dollars of bills received in the four months after receiving a disconnect notice. The Figure shows that three times more program participants were paying their entire bill plus something toward their arrears than were program non-participants.



The same impact (*i.e.*, the relative effectiveness or success of collection efforts with and without an affordability program) can be examined by considering the ***lack*** of effectiveness (or success) of collection efforts. The Figure below, again taken from the PSCO evaluation, examines the proportion of affordability program participants and non-participants who made ***some*** payment in the four months after receiving a notice of disconnection for nonpayment, but whose dollars of payments were less than 50% of the dollars of bills they received during that same four month period. A customer payment coverage ratio of less than 0.50 means that the customer payments in the four month period after receipt of a DNP notice were less than one-half of the bills for current usage in those four months. A customer with a payment coverage ratio of less than 0.5 is paying ***nothing*** toward retiring their arrears, since they are paying less than half of their current bill.

As described above, a collection activity that generates a payment in the month of the activity, only to see the customer fall back into a pattern of nonpayment in the immediate subsequent months, is deemed to be "less effective" than a collection activity that generates a series of more complete payments over a period of months. In the Figure below, a lower number is "more successful" and a higher number is "less successful." A higher figure means that a greater proportion of customers receiving a disconnect notice for nonpayment made customer payments equal to less than half of their bill for current usage in the ensuing four months. As can be seen, the affordability program participants substantially out-performed the non-participants. While roughly 20% of low-income program non-participants were paying less than half of their bill for current service after receiving a disconnect notice for nonpayments, only roughly five percent (5%) of program participants were.



Either of the two Charts immediately above alone, but certainly both of the two Charts in combination one with the other, document that a bill affordability program can be expected to improve the success of a utility's collections performance. Substantially more program participants were paying their entire bill and retiring their arrears after receiving a disconnect notice for nonpayment. Substantially fewer program participants were paying less than half of their bill after being subjected to a collection activity.

v. Improved Price Signals.

One clear impact of a low-income bill affordability program is the extent to which such a program improves the "price signals" delivered to inability-to-pay customers through utility rates.

As a general rule, utility bills represent an ineffective means to send price signals to low-income customers. Low-income customers, particularly customers with bill burdens exceeding a prescribed level, pay less than their entire bill. As a result, a low-income customer's inability-to-pay for utility service substantially distorts the price signal that consumer receives. When customers cannot afford to pay their utility bills, in other words, price signals are not effective.

The viability of sending a price signal assumes that the customer has the ability to ***receive and to act upon*** the signal.[46] If a customer has an ability to pay $50 per month, in other words, the price signal sent to a customer by receiving a bill of $75 rather than $65 is negligible, if any signal exists at all. In contrast, the price signal received through a bill for $49 rather than a bill for $55 is more significant. The closer that Connecticut utilities can tailor rates to reflect affordability, the more efficacious any price signal will be. A low-income discount program that reduces bills to an affordable level actually ***improves*** the price signaling of utility rates.

Without an affordable bill, any price signal is impeded in two ways.

- First, the price signal provided through the price of current consumption is only effective if a customer has the ability to receive and respond to that price signal. When a customer can afford to pay only a fraction of the bill with which to begin, the impact of the per-unit price becomes less meaningful.

- Second, the impact that the price of current consumption has on the total bill is diluted to the extent that there are substantial arrears wrapped into the ***total*** bill. Prices only send a "price signal" if the ***current*** bill and the ***total*** bill are reasonably the same.

Given these two fundamental truths set forth in any elementary price theory, the extent to which an affordable bill program improves price signals can be examined. The discussion below will focus on data from electric utilities offering bill affordability programs in Pennsylvania.

The discussion below considers the seven electric utilities offering affordable bills in Pennsylvania.[47] The Table below shows the average bill for current consumption under standard residential rates; the affordable bill; and the "CAP credit" (*i.e.*, the difference between the affordable bill and the bill at standard residential rates).

[46] From an economic theory perspective, it is easy to understand this result. From a price theory perspective, price signals "work" only if there is adequate information about price and quality. The inability-to-pay, and the resulting arrears, impedes this information process. By improving this information process, while maintaining the task of reflecting increases and decreases in a bill, the bill affordability program improves rather than distorts the price signal. *See generally*, Colton (1990). "Customer Consumption Patterns within an Income-Based Energy Assistance Program." 24 Journal of Economic Issues 1079.

[47] Duquesne Light, Metropolitan Edison, PECO Energy, Pennsylvania Electric Company (Penelec), Penn Power Company, Pennsylvania Power and Light (PPL), and West Penn Power Company.

Table 7. Impact of Affordable Bill on Ability to Receive Price Signals through Utility Bills			
Program Year: 2013	Bill at Standard Rate (actual bill)	Affordable Bill (price signal received)	Difference Between Actual Bill and Bill at which Price Signal Received
Duquesne Light	$1,267	$924	$343
Met Ed	$1,452	$684	$768
PECO Energy	$1,393	$828	$565
Penelec	$1,205	$552	$653
Penn Power	$1,123	$468	$655
PPL Utilities	$1,982	$948	$1,034
West Penn Power	$1,356	$1,020	$336

As can be seen, a change in the bill at standard residential rates would have no impact on sending a "price signal" to these inability-to-pay customers. The annual bills at standard residential rates are hundreds of dollars away from being at a level where a change would send any reasonable price information to the program participants. The bills at standard rates range between 30% and 140% greater than the bill level which delivers an effective price signal. In contrast, with 90% (or more) of the bill under CAP actually being paid, any change in price (or consumption) that may affect the bill under the affordability program will have an impact on whether the bill is paid, or whether the bill remains unpaid. As a result, effective price signals are enhanced.

Carrying a substantial arrears also impedes the price signal delivered by the price for current service. The Colorado program illustrates this impact. PSCo's low-income population brought an average of nearly $350 of pre-existing arrears[48] in to the low-income bill affordability program. The bulk of those arrears came from participants with large (*e.g.*, greater than $1,000) pre-existing arrears. A full 60% of the pre-existing arrears were associated with accounts owing more than $1,000, with more than half of that brought by accounts owing more than $2,500. Even at the lowest range of arrears, however, (>$0 to $300), the average arrears that would have been attached to total bills was $132. Changes in prices for current service, therefore, would have sent no "price signal" given this expansion of the total bill charged to consumers. A one percent increase in price for current service, in other words, would not result in a one percent increase in the total bill for service. Each one percent increase in price would instead be diluted to the extent that the account carries arrears.

[48] This average is the average arrears spread over all customers, not the average spread over only the customers having arrears.

Table 8. Pre-existing Arrears at the Time of Enrollment by Size of Arrears (PSCO Program Participants)

Level of Pre-existing Arrears	Percentage of Accounts	Percentage of Dollars	Average Arrears
$0 or less	36%	0%	$0
> $0 - $300	39%	15%	$132
> $300 - $500	9%	10%	$388
> $500 - $1,000	8%	16%	$695
> $1,000 - $2,500	6%	28%	$1,578
> $2,500	3%	32%	$4,250
Total	100%	100%	$347

Arguments about the adverse impact of affordable bills on the "price signals" sent by utility bills are not well-founded. Not one single evaluation of an affordable bill program prepared within the past 30 years has found a systematic increase in consumption resulting from the program. Rather than impeding price signals, entirely consistent with elementary price theory, affordable bill programs have been found to improve the price signals embedded in utility rates.

vi. Summary and Conclusions

The data and analysis presented above supports the conclusion that an appropriately designed and well implemented utility bill affordability program, as an integrated part of the rate structures of Connecticut utilities, is in the public interest. A rate affordability program can be designed to be a more cost-effective approach for dealing with issues of customer inability-to-pay than are traditional collection methods.

The positive social outcomes associated with low-income affordability programs represent benefits that are above and beyond the utility-related benefits produced by such programs. From a purely business perspective, a low-income rate affordability program can reasonably be expected to generate the following utility-related business benefits to Connecticut utilities:

1. A bill affordability program will result in an increase in the bill payment coverage ratio of participating low-income consumers.

2. A bill affordability program will result in an increase in the "net back" experienced by the utility offering the affordability program. Net back is the total net cash realized by the utility taking into account both the rate of payment and the cost of collection.

3. A bill affordability program can be expected to increase the productivity of utility collection efforts directed toward low-income customers. Improvements in the productivity of collection activities can occur in either of two ways: (1) the need for collection interventions can be reduced thus allowing an increased payment per each collection intervention performed; or (2) the customer response to the collection activity can improve thus allowing an increased payment per each collection intervention performed.[49]

4. A bill affordability program can be expected to reduce the intensity of collections efforts which a utility directs towards its low-income customers.

5. By addressing the underlying inability-to-pay utility bills, a bill affordability program can be expected to increase not only the productivity of collection efforts, but it can be expected to increase the long-term success of collection efforts as well.

6. An affordable bill program can be expected to improve the incidence at which participating low-income customers make complete bill payments (*i.e.*, a payment yielding a $0 balance).

7. One clear impact of a low-income bill affordability program is the extent to which such programs improve the "price signals" delivered to inability-to-pay customers through utility rates.

B. ADDING IN THE INDIRECT UTILITY BENEFITS.

Aside from the direct financial benefits of promoting home energy affordability as discussed above, the provision of affordable rates will generate considerable additional financial benefits to Connecticut utilities as well. These benefits should be considered as instrumental uses in furthering business objectives.[50] The extent of these instrumental uses document that the offer of low-income

[49] An additional increase in the productivity of collections, not discussed in these comments, will occur because utility collection efforts will be re-directed away from low-income customers who do not have the ability to pay and toward non-low-income customers who do have the ability to pay.

[50] See *e.g.*, The Conference Board of Canada (1995). Dimensions of Diversity in Canadian Business: Building a Business Case for Valuing Ethnocultural Diversity, The Conference Board of Canada: Ottawa (ONT); *see also*, Taylor (1995). Building a Business Case for Diversity, Canadian Business Review, 22(1):12-14.

affordability programs can be "grounded in economic rationality and self-interest."[51] In this respect, the consideration of these additional business benefits should be viewed in the same way that the business benefits of multiculturalism are viewed. As the Department of Canadian Heritage found:

> Another problem that emerges in respect of cross-cutting, strategic policies, such as multiculturalism, is the public nature of the benefits they produce. Expenditures on multicultural policies oftentimes yield non-specific benefits (externalities) that cannot be entirely appropriated by any one agency or department. This is a situation that chronically leads to under-investment, even where there is a business case to be made because overall benefits outweigh costs.[52]

The benefits of providing affordable energy are much akin to the business benefits of providing multiculturalism in these regards. The affordability of home energy yields "non-specific benefits" (*e.g.*, public health, public safety, improved nutrition, improved education) that cannot be entirely appropriated by the utility providing the energy. As a result, the utility traditionally under-invests in affordability programs.

i. Workforce Impacts/Internal Productivity

Initiatives such as an affordable home energy program proposed herein can deliver business benefits through enhanced staff productivity. The inability (or unwillingness) to effectively manage the growing presence of factors creating conflict creates business costs that impede "desired organization and business outcomes."[53] According to a February 2010 analysis of the costs and benefits of promoting workplace diversity by the U.S. Military Leadership Diversity Commission, "such costs can be direct (*i.e.*, produced by turnover and absenteeism among employees who are the minority in their work group) or indirect (*i.e.*, the result of conflict or reduced communication between employees who are different)."[54]

The provision of affordable low-income rates allows utility customer service representatives to avoid imposing similar direct and indirect productivity costs on the company. The provision of affordable low-income rates provides utility staffpersons greater satisfaction in their jobs. By enhancing home energy affordability on the front-end, utility staff face fewer customer

[51] Compare, Burstein (2004). Developing the Business Case for Multiculturalism, at 9, Outreach and Promotion Directorate, Multiculturalism and Human Rights Branch, Department of Canadian Heritage: Ottawa (ONT); *see also*, Gandz (2001). A Business Case for Diversity, Richard Ivey School of Business, University of Western Ontario.
[52] Business Case for Multiculturalism, at 12.
[53] Military Leadership Diversity Commission (2010). Business-Case Arguments for Diversity and Diversity Programs and Their Impact in the Workplace, 2, Issue Paper #14, Military Leadership Diversity Commission: Arlington (VA).
[54] Id.

confrontations, have a greater number of options available leading to successful conclusions from the customer/company interaction, generate a higher success rate in obtaining payment, and reduce the daily stress imposed on staff addressing nonpayment situations.

Improving employee satisfaction delivers business benefits to the utility.[55] "[E]mployees with supportive workplaces are the most satisfied with their jobs and the most loyal, which leads to reduced turnover among workers as well as a reduction in the costs related to such turnover."[56] As the Military Leadership Diversity Commission found, "retention and turnover of personnel are fundamental concerns for. . .businesses. There are significant costs associated with recruiting for replacements, and organizations make considerable investments in training each individual."[57] Helping to reduce "avoidable turnover costs" may have "real bottom-line financial implications for firms."[58] Costs are associated with retention, recruitment, training and related employee activities.

ii. Revenue Impacts: Business Locational Decisions.

Offering affordable rates to low-income customers can be expected to have long-term positive impacts for a utility from the perspective of maintaining and expanding its revenue base. The provision of a strong social safety-net so that individuals and households do not face the deprivation of basic household necessities is a strong and growing factor in businesses making locational decisions. These locational factors are particularly important for high technology firms, which represent a particularly strong future growth potential for the economy. Research for Ontario's Ministry of Enterprise, Opportunity and Innovation, in collaboration with the Institute for Competitiveness and Prosperity, reports that sound economic development policy includes ensuring that "the right social investments are made to ensure social harmony."[59]

[55] Duboff and Heaton (Jan/Feb. 1999). Employee Loyalty: A Key Link to Value Growth, Planning Review, 27(1).
[56] Fairfax (2003). The bottom line on board diversity: A cost-benefit analysis of the business rationales for diversity on corporate boards, 2005 Wisconsin Law Review 795, 829 (2005); *see also*, Harter, *et al.* (2002). Business-Unit-Level relationship between employee satisfaction, employee engagement, and business outcomes, Journal of Applied Psychology, 87, 268 – 274,
[57] Business-Case Arguments for Diversity, at 3.
[58] McKay, *et al.* (2007). Racial differences in employee retention: Are diversity climate perceptions the key?, Personnel Psychology, 60, 35-62; see also, Jackson et al. (1991). Some differences make a difference: Individual dissimilarity and group heterogeneity as correlates of recruitment, promotions and turnover, Journal of Applied Psychology, 76, 675-689.
[59] Gertler (2002). Competing on Creativity: Placing Ontario's Cities in North American Context, report produced for the Ontario Ministry of Enterprise, Opportunity and Innovation and the Institute for Competitiveness and Prosperity. In this sense, affordable home energy can be viewed in the same way that health and education are viewed. "There are numerous empirical studies that demonstrate the links between education, health and competitiveness. In particular, both health and education are correlated with superior economic outcomes such as higher productivity, higher per capita incomes, and faster growth." Business Case for Multiculturalism, at 8.

These results are confirmed by research looking specifically at the relationship between poverty and business competitiveness. The *Competitive Assessment* of the Indiana economy was prepared by Market Street Services for the Indiana Department of Commerce. According to the final report, released in January 2002, the purpose of that Department of Commerce sponsored study was "to help the State clearly assess its competitive position both in relation to other states and the nation." The Indiana Department of Commerce report said:

> The Corporation for Enterprise Development (CFED) identified several key challenges that must be overcome at the state level in particular, to achieve successful economic development in the near future. The *primary barriers or problems that exist today* include sprawl and unmanaged growth, the negative impacts of globalization, such as fragmenting markets and global competitors, *and income inequality from unequal earnings*.[60]

(emphasis added). The *Indiana Competitive Assessment* reported that "cost of living is a common consideration for employers making expansion and relocation decisions as they attempt to retain and recruit qualified employees." The Department of Commerce's report then found: "Regional meeting participants stated time and again that they feel Indiana is a very affordable place to live *for people of all income levels*. Participants felt that the moderate cost of living *helps their competitive* [posture] with other Midwestern states as well as places around the country." (emphasis added). The report then finally noted that Indiana should: "keep[…] in mind that pockets of poverty –whether the businesses locate there or not—is not a business climate asset overall."

While this assessment was made with respect to telecommunications, it is consistent with the continuing statements made throughout the Indiana *Competitive Assessment* report about the need, from the perspective of maintaining the competitiveness of Indiana business and industry, to address pockets of poverty to ensure that these pockets are not "left behind."

The observation here is being increasingly recognized as relevant to various services. "It should be noted that businesses focus on quality of life considerations when making location decisions because they are relevant for attracting a high quality workforce."[61] Quality of life has been deemed particularly influential for companies involved in research and development and high technology, and in enterprises employing highly skilled workers in information or knowledge-based services and production. Evidence of this observation is a study conducted by Love and Crompton in which they surveyed 174 decision makers of businesses that had initiated, expanded

[60] Market Street Services. Indiana Competitive Assessment, at 8, Indiana Department of Commerce: Indianapolis (IN).

[61] Taylor, *et al.* (2006). A Cost-Benefit Analysis of Universally-Accessible Pre-Kindergarten Education in Texas, Bush School of Government and Public Service, Texas A&M University: College Station (TX).

or relocated to Colorado. "In the previous five years. . .quality of life was considered the second most important factor for prompting the business move and not selecting a specific community, as well as the third most important factor in the final selection of a specific community."[62]

The connection between assuring access to basic household necessities and maintaining the competitiveness of the local economy has been recognized.[63] Given the reliance of utility sales, revenues and profit on a strong economy, to the extent that a Connecticut utility contributes to this local competitiveness, the utility will derive benefits as a result. In this regard, the local utility is not merely a participant in the local economy, but is a direct and active beneficiary of a thriving local economy.

iii. Reputational Capital.

The adoption of an affordable home energy program will benefit Connecticut utilities in that it will expand the "reputational capital" of those utilities. Adopting a low-income program allows the utility to acknowledge that it is taking proactive efforts to ensure the availability of home energy as a basic human need. Pursuing such programs allows the utility to speak from a position of strength of community involvement. The enhanced ability of the utility to speak with "moral authority" is a business asset that adds value to the corporation.[64]

This notion of "moral authority" is not a theoretical construct that has little practical meaning to the financial performance of the utility.[65] It is associated with "reputational capital," which in turn has multiple operational and financial implications. On the one hand, corporations that enhance their reputational capital through programs such as a low-income discount help to preserve what the Center for Corporate Citizenship refers to as their "license to operate" (sometimes referred to as their "freedom to operate"). "In coming years, it will be important for companies to find ways to prevent or reduce the cost of challenges to their projects and operations. By developing a presence as corporate citizens through positive actions in communities and society, businesses can preserve

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[62] Id. (citations omitted).

[63] Improving the Competitiveness and Standard of Living of Canadians: Common Position of Provincial and Territorial Finance Ministers (December 1999); *see also*, Human Resources and Skills Development Canada, Social and Economic Impact of Labor Standards (March 2008); Pindus, *et al.* (2007). Place Matters: Employers, Low-Income Workers and Regional Economic Development, The Urban Institute: Washington D.C. ("racial inclusion and income equality can enhance regional economic growth") (citations omitted).

[64] Business Case for Multiculturalism, at 9.

[65] "A University of Pittsburgh Business School review of 46 studies on the links between [corporate social performance] and [corporate financial performance] found a positive relationship between social and financial performance. . .thirty-two studies found a positive relationship between social and financial performance. Five studies found a negative relationship between social and financial performance. Fourteen studies found no effect or an inclusive relationship between social and financial performance." Roman, *et al.* (1999). The Relationship Between Social and Financial Performance. Business and Society 38(1).

and enhance their license to operate."[66] Viewed in this way, the business benefits associated with this impact arise with respect to projects ranging from construction / development proposals to acquisition strategies, both of which are particularly applicable to electric and natural gas utilities. Enhanced reputational capital attributable to social performance has been found, for example, to allow companies to forego and/or minimize costly battles for site placement with communities and/or government officials.[67]

The contribution which an affordable home energy program makes to enhanced reputational capital generates business benefits to Connecticut utilities in a number of ways.[68] An enhanced reputational capital affects the full-range of stakeholders in the Connecticut community: customers, employees, regulators, and the broader community. Each of these stakeholders with whom Connecticut interacts will contribute to the financial benefits derived by a utility.

iv. Summary and Conclusions.

The discussion in this section documents how promoting affordable home energy, in addition to generating "public benefits," generates an entire range of corresponding private benefits to the utility, where individual utilities will capture a part of the benefits arising from those social impacts. These business benefits are not merely ***associated*** with the positive social impacts, they are ***inextricably tied*** to the social impacts.

Simply because these benefits involve complex, multi-dimensional outcomes does not mean they should be ignored. As the Center for Corporate Citizenship reports: "current evidence suggests that corporate social performance and corporate financial performance are positively linked, that they can influence one another, and that both directions of causality are statistically significant and positive."[69]

[66] Determining the Value of Corporate Community Involvement, at 7.
[67] Waddock and Graves (March 1996). Good Management and Good Stakeholder Relations; Are They Synonymous," presented at the Annual IAMBS Annual Meeting.; *see also*, Waddock and Graves (1997). The Corporate Social Performance-Financial Performance Link, Strategic Management Journal, 18(4). 303-319.
[68] Rochlin and Googins (2005). The Value Proposition for Corporate Citizenship, at 12, Center for Corporate Citizenship: Boston College, Chestnut Hill (MA); *citing* Nelson and Bergrem (2003). Values and Value: Communicating the Strategic Importance of Corporate Citizenship to Investors, World Economic Forum/International Business Leaders Forum.
[69] Rochlin (2000). Making the Business Case: Determining the Value of Corporate Community Involvement, at 2, Center for Corporate Citizenship at Boston College: Chestnut Hill (MA) ("a compelling new argument contends that the traditional view of corporate involvement in social issues –that of being a soft 'add-on' which may distract from core functions—is outmoded. Today, observers from a variety of sectors propose that not only is corporate citizenship consistent with good business practice, it is in fact a business essential." Id., at 4).

It would be appropriate, for Connecticut to consider these financial benefits in any assessment of the economic impacts to the state's utilities arising from the adoption of a low-income affordability program.

Part 3. Non-Utility Business Benefits.

Quite aside from the private economic benefits arising to Connecticut's utilities, the adoption of low-income affordability programs by Connecticut's utilities would generate substantial benefits to the state's business community. One comprehensive study published in 2004 concluded:

> Why the under-use of public benefits is a problem. When most people hear about the idea of marketing public benefits through employers, their initial reaction is "why would a company want to get involved with a social service program?"
>
> In fact, employers have good reason to be concerned that large numbers of working people with low family incomes do not take advantage of the public benefits intended to help them and their families achieve economic sufficiency--benefits that also help employers by contributing to the economic stability of their workforces. These public benefits bolster the ability of low-income workers to meet their basic needs, in effect providing a wage supplement to employers.[70]

[70] Scott (2004). "Private Employers and Public Benefits," Workforce Innovation Networks (WINS): Boston (MA) and Washington D.C. WINS is a collaboration of Jobs for the Future, the Center for Workforce Preparation of the U.S. Chamber of Commerce, and the Center for Workforce Success, The Manufacturing Institute of the National Association of Manufacturers. Available at: https://www.jff.org/resources/private-employers-and-public-benefits/.

Note that these conclusions are reached by business stakeholders: the U.S. Chamber of Commerce and the National Association of Manufacturers.

Considerable research supports the proposition that any increase in utility costs to business from the support of universal service costs would be offset by increases in employee productivity. Poverty produces ill-prepared workers whose lives are easily disrupted by small catastrophes. If the car breaks down, if a child gets sick, it suddenly becomes impossible to be a reliable worker. Poverty also generates poor health among workers, making them less reliable still and raising the cost of employing them. Paying a small increase in costs to help generate these offsetting benefits is a reasonable investment for a business to make.

Initiatives such as a utility-funded affordability program, while obviously not a solution standing by itself, is one *part* of the solution. In addition to addressing utility payment problems, home energy affordability programs can help address trends toward housing abandonment, [71] reductions in educational attainment,[72] and adverse health outcomes for payment-troubled utility customers.[73]

A 2014 study by the Consumer Financial Protection Bureau[74] (CFPB) reports that "even when the economy was booming, financial stress was sapping the productivity and hurting the health of millions of American workers."[75] According to the CFPB:

> Multiple surveys offer ample evidence of the impact of financial stress at work. For example, in 2012, roughly one in five employees admitted they had skipped work in the past year to deal with a financial problem. Among workers now in their 30's and 40's – a critical cohort of the American workforce - stress levels are even higher. Many Generation X workers (29%) say their personal finances distract them at work, and a majority (53%) find it stressful to deal with their personal finances. This is a particularly salient finding given that Gen Xers – those born between 1964 and 1980 – are beginning to enter their peak-earning years. If they are financially stressed now, Gen Xers may have more difficulty

[71] *See*, text accompanying notes 102 - 111, *infra*.
[72] Colton (1996). "The Road Oft Taken: Unaffordable Home Energy Bills, Forced Mobility And Childhood Education in Missouri," 2 Journal on Children and Poverty 23.Available at: https://www.tandfonline.com/doi/abs/10.1080/10796129608414757.
[73] *See generally*, Apprise, Inc. (2018). National Energy Assistance Survey: Final Report, National Energy Assistance Directors' Association: Washington D.C. Available at: http://www.appriseinc.org/resource-library/selected-reports/energy-survey-research-and-policy-analysis/.
[74] CFPB (August 2014). Financial wellness at work: A review of promising practices and policies. https://www.consumerfinance.gov/data-research/research-reports/financial-wellness-at-work/.
[75] Financial wellness at work, at 6, citing Garman *et al.*, Financial Stress Among American Workers: Final report: 30 Million Workers in America –One in Four—Are Seriously Financially Distressed and Dissatisfied Causing Negative Impacts on Individuals, Families, and Employers, 17 2005).

> than other generations finding security in the future. Across workers of all generations, 24% admit their personal finances have been a distraction at work. And, of those workers who are concerned about their finances, 39% spend at least three hours each week either thinking about or dealing with financial problems at work.[76]

According to the CFPB:

> It's not just employees who want help managing financial stress at work. Managers confront this stress every day. In a recent survey, 61% of human resources professionals say financial stress is having some impact on employee work performance. Twenty-two percent say worries over personal finances have a "large impact" on employee engagement.[77]

The costs to employers can be substantial, and engaging in activities to reduce these costs can be helpful to employers. One white paper presented "an overview of the research literature related to financial stress, how it can affect employee productivity, and real world data regarding the estimated costs to businesses when financially stressed employees are left to struggle on their own."[78]

Financial stress adversely affects employers both through absenteeism and presenteeism.[79] According to Menard:

> Academic researchers have studied the costs of absenteeism, presenteeism, and employee turnover specifically associated with employee financial stress, and have estimated these costs based on real world data. Absenteeism from work

[76] Id., citing MetLife, Inc., 10th Annual Study of Employee Benefits Trends: Seeing Opportunity in Shifting Tides 51 (2012), available at http://www.winonaagency.com/img/~www.winonaagency.com/10th annual met life study of benefits trends.pdf ("22% of employees admit that they have taken unexpected time off in the past 12 months to deal with a financial issue and/or spent more time than they think they should at work on personal financial issues . . . ."). 15% of Gen Y respondents, 10% of Gen X respondents, 5% of Younger Boomer respondents, and 1% of Older Boomer respondents admitted to the same; PricewaterhouseCoopers, LLC, Employee Financial Wellness Survey 10,11 (2014), available at http://www.pwc.com/en_US/us/private-company-services/publications/assets/pwc-employee-financial-wellness-survey-2014-results.pdf.

[77] Id., citing Society for Human Resource Management, SHRM Research Spotlight: Financial Education Initiatives in the Workplace 2 (2012), available at https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/Documents/Financial_Education_Flier_FINAL.pdf.

[78] Menard. (June 2017). Improving Employees' Financial Wellness: Why it Matters and What Employers Can Do About It." https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3011461.

[79] "Presenteeism" has long been recognized in both the industry and academic literature. *See, e.g.,* Hemp (October 2004). Presenteeism: At Work but Out of It, Harvard Business Review https://hbr.org/2004/10/presenteeism-at-work-but-out-of-it.

> resulting from worrying about personal finances and employee turnover in particular represents a problem that has been well documented in the literature, and higher levels of financial stress are associated with higher levels of absenteeism, particularly among blue-collar workers. A recent survey of over 5,000 US workers by the company Willis Towers Watson found that employees who are worried about their finances are absent on average for 3.5 days annually.[80]

According to Menard, "financially troubled employees bring [their] concerns to work." Dr. Menard reports:

> The previously mentioned Mercer survey found that 16% of employees reported spending more than 20 working hours each month worrying about money. The average across those surveyed was 13 hours per month. For an individual employee, that is equal to 7.8% of their annual work time spent being distracted as a result of their financial situation. Other estimates are even higher. Garman and colleagues peg financial presenteeism and absenteeism costs at 15-20% of total compensation paid to all employees in the businesses studied. . .The Mercer survey also found that 22 percent of employees report missing at least one day of work to handle financial problems, and a full 20 percent have had to resign from jobs due to financial stress.[81]

Menard's work was confirmed by research of the International Foundation of Employee Benefit Plans ("IFEBP"). That research concluded:

> Financially distressed workers are more likely to miss work—not surprising given persons with financial stress tend to have more physical and mental health problems than those who are financially healthy. In fact, 70% of all job absenteeism has been tied to stress-related illnesses.
>
> Even when employees do show up for work, they are likely to demonstrate some degree of presenteeism due to fatigue and/or an inability to concentrate. Presenteeism occurs when employees come to work but are not functioning up to their capabilities. It manifests itself in a host of ways including more time spent on tasks, poor-quality work, impaired social functioning, burnout, anger and low morale.

[80] Menard, *supra*, at 6 (internal notes omitted).
[81] Menard, *supra*, at 7 (internal notes omitted).

> One in five employees (20%) reports issues with personal finances have been a distraction at work. More than one-third (37%) say they spend three hours or more each week thinking about or dealing with issues related to personal finances.[82]

The fact that employee financial problems affect the employer is recognized widely within industry circles. For example, according to one report by the Society for Human Resource Management ("SHRM"), "when employees are stressed financially, their health and productivity can both suffer."[83] According to SHRM, 48 percent of human resource managers report workers are struggling and stressed over "covering basic living expenses." SHRM reports that 60% of employers indicate that personal financial issues affect their "workers inability to focus at work" and 34% report such issues result in "absenteeism and tardiness."

A different survey, this one of employers rather than employees, asked employers about their workers' financial stress. "The survey found that financially stressed employees are not able to check their worries at the door; they typically spend over three hours per week dealing with personal finance at work and lose nearly one month of productive work time (23-31 days per year) over financial concerns." This survey states that "there may be a strong correlation between poverty and financial stress," though it acknowledges that "low wages" are not "completely to blame."[84]

Finally, an increase in health care costs is one of the most cited costs imposed on employers due to financial stress. As CFPB reported:

> there is reason to consider whether financial stress may also raise employer health care costs, specifically, the documented link between psychological stress and physical health and well-being. . . [R]esearchers have attempted to quantify the overall cost to employers from all forms of stress, and they have found those costs are not trivial. . . [R]esearchers at Ohio State surveyed 9,200 people between 2005 and 2011 to learn more about their stress levels. The findings of the Consumer Finance Monthly surveys indicate one in five people report debt stress has had a high negative impact on their health. Judging from the available survey evidence,

[82] Bonner (Nov./Dec. 2016). The Impact of Financial Stress on Your Employees, Plans and Trusts, Vol. 34:6: 18-24. https://www.ifebp.org/inforequest/ifebp/0200354.pdf.
[83] Miller (April 2016). Employees' Financial Issues Affect Their Job Performance." Available at: https://www.shrm.org/resourcesandtools/hr-topics/benefits/pages/employees-financial-issues-affect-their-job-performance.aspx.
[84] Macklin (August 2019). Businesses Losing $500 Billion Due to Employees Financial Distress, H.R. Technologist Weekly Newsletter. Available at: https://www.hrtechnologist.com/articles/compensation-benefits/businesses-losing-500-billion-due-to-employees-financial-stress-2/.

> a large share of the American population reports they suffer from chronic financial stress, and they blame that stress for hurting their health.[85]

The costs to businesses can be quantified, and they are substantial. One study, published in the journal *Health Affairs*, for example, analyzed the health risks and medical expenses of more than 92,000 employees over a three-year period. The study found that "those reporting high stress were $413 more costly per year on average than workers who were not at risk from stress. By comparison, smoking – a common health risk targeted by corporate wellness programs – was found to raise health care costs by $587 dollars on average."[86] The study concluded that "Since financial problems are an important stress factor, it appears employers may be paying a high cost for employee financial stress, but they do not recognize it because a large portion of that expense shows up indirectly as a health care expense."[87]

There is a direct relationship between the offer of a utility bill affordability program and economic benefits to local commercial and industrial customers. For example:

- Turnover costs businesses money. Unaffordable home energy bills are known to lead to the frequent mobility of households.[88]

- Time missed due to family care provision costs businesses money. Unaffordable home energy bills are known to lead to more frequent childhood illnesses.[89]

- Time missed due to lack of employee productivity and employee illness costs businesses money. The inability to stay warm due to unaffordable home energy bills

[85] CFPB Financial Wellness at Work, *supra*, *citing*, Dunn and Mirzaie, Working Paper, Determinants of Consumer Debt Stress: Differences by Debt Type and Gender (2012), available at http://www.chrr.org/content/surveys/cfm/doc/DSI-Working-Paper-07-19-12.pdf; Goetzel et al., Ten Modifiable Health Risk Factors Are Linked To More Than One-Fifth Of Employer-Employee Health Care Spending, 31 Health Affairs 2474 (2012).; Goetzel, *et al.*, The relationship between modifiable health risks and health care expenditures, 40 J. Occup. Environ. Med. 843 (1998) (showing an analysis of the multi-employer HERO health risk and cost database). https://journals.lww.com/joem/Abstract/1998/10000/The_Relationship_Between_Modifiable_Health_Risks.3.aspx. https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2011.0819; Health Poll, AP-AOL/ABT SRBI (2008), http://surveys.associatedpress.com/data/SRBI/AP-AOL%20Health%20Poll%20Topline%20040808_FINAL_debt%20stress.pdf.

[86] Id.

[87] Id.

[88] Colton. "A Road Oft Taken: Unaffordable Home Energy Bills, Forced Mobility, and Childhood Education in Missouri," 2 Journal of Children and Poverty 23 (1996). Available at: https://www.tandfonline.com/doi/abs/10.1080/10796129608414757.

[89] Bhattacharya, *et al.* (June 2002). Heat or Eat? Cold Weather Shocks and Nutrition in Poor American Families, National Bureau of Economic Research: Cambridge (MA). Available at: https://ajph.aphapublications.org/doi/10.2105/AJPH.93.7.1149.

> is known to lead to increased illnesses, including pneumonia, influenza, and other infectious diseases.[90]

In sum, increasing employee productivity directly contributes to the increased profitability of firms. With low-wage employees, in particular, unaffordable home energy directly contributes to lowered productivity. Increased personal illness, increased employee turnover, and increased family care responsibilities are but three of the factors contributing to lower employee productivity. The provision of affordable energy positively affects each of these productivity factors.

A utility-funded program to deliver affordable home energy bills as a percentage of household income to residents of Connecticut will deliver considerable benefits to the businesses of Connecticut. In this regard, an affordable utility bill program is analogous to the provision of other public goods. For example, investments in child care have been found to yield direct benefits to business. On a macro basis, as the Committee for Economic Development has reported, "business and the economy as a whole gain a more productive work force when employees feel confident that their children are secure and learning."[91] This is not merely a statement of policy, it is a conclusion based on considerable empirical research: "Those companies that have taken steps to address the child care needs of their work force report that they have improved their ability to attract and retain high-quality personnel, thereby enhancing their current work force and their competitiveness."[92]

Similarly, the Committee for Economic Development stated with respect to financial investment in universal education that:

> a firm and enduring commitment to excellence in education on the part of America's business community is not merely a matter of philanthropy; it is enlightened self-interest. As employers, taxpayers, and responsible community members, business can regard an investment in education as one that will yield a handsome return.[93]

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[90] Apprise, Inc. (December 2018). 2018 National Energy Assistance Survey: Final Report, National Energy Assistance Directors' Association (NEADA): Washington D.C. Available at: http://www.appriseinc.org/wp-content/uploads/2019/02/NEADA-2018-LIHEAP-Survey.pdf.

[91] Research and Policy Committee (1993). W*hy Child Care Matters: Preparing Young Children for a More Productive America, A Statement by the Research and Policy Committee of the Committee for Economic Development*, at 1, Committee for Economic Development: New York.

[92] *Why Child Care Matters*, *supra*, at 3.

[93] Research and Policy Committee (1985). Investing in our Children: Business and the Public Schools, A Statement by the Research and Policy Committee of the Committee for Economic Development, at 5, Committee for Economic Development: New York.

Precisely the same conclusions can be reached about an investment in affordable utility bills. It "is not merely a matter of philanthropy, it is enlightened self-interest." In sum, affordable utility service generates benefits to businesses that, without question, are in addition to the benefits to individual households, and in addition to the benefits to the utilities themselves.

Part 4. Community Benefits

Setting aside the positive business outcomes to Connecticut's utilities associated with a low-income affordable bill program, as well as the benefits to Connecticut's business community, the state's municipalities will recognize specific beneficial outcomes to their finances as a result of a rate affordability program.

A. EDUCATIONAL COSTS OF FREQUENT MOBILITY

One impact of unaffordable home utility service is the forced mobility of households. "Forced mobility" occurs when households are required to change residences, either inside or outside a utility's service territory, in response to unaffordable service. This mobility may occur because the current residence is rendered uninhabitable due to the lack of utility service; because the household has insufficient funds to reasonably expect that its arrears to a particular utility will ever be retired and thus moves; or because the household simply seeks shelter with more affordable utility costs.

Adverse education outcomes result from this frequent mobility.[94] Third-graders who have changed schools frequently are two-and-a-half times as likely to repeat a grade as third-graders who have never changed schools. Of the nation's third-graders who have changed schools frequently, 41 percent are below grade level in reading, compared with 26 percent of third-graders who have never changed schools. 33 percent of children who have changed schools

[94] Colton (1996). A Road Oft Taken: Unaffordable Home Energy Bills, Forced Mobility and Childhood Education in Missouri, 2 Journal on Children and Poverty 23.

frequently are below grade level in math, compared with 17 percent of those who have never changed schools.

When children changed schools four or more times, they are more likely to drop out of school. Children who changed schools four or more time by the Eighth Grade were at least four times more likely to drop out than those who remained in the same school.

The adverse impacts associated with the frequent mobility associated with unaffordable home utility bills, however, arise not simply for the children affected, but also for the school districts who are charged with educating these children. Highly mobile students pose problems to the school systems. High numbers of mobile children interfere with teachers' ability to organize and deliver instruction. Teachers find it difficult to assess the needs of such new children, determine their past education experiences, and provide instruction that builds on these experiences. These tasks may be especially difficult when many new children enter the classroom throughout the year, often with no advance notice.

Teachers in schools with high proportions of children who change schools after the beginning of the year report that these school changes disrupt classroom instruction, and teachers must spend additional time on non-instructional tasks. Teachers may therefore not have the time to identify gaps in such a child's knowledge; moreover, these gaps may grow as the child is left on his or her own to make sense of the new curriculum and its relationship to the one at the previous school.

While not related to school costs, the frequent mobility of school-age students, particularly if between school systems, may also adversely affect school revenues. To the extent that individual schools receive state aid to education based on the number of "student days" of attendance, actual dollars of state support will decrease as schools lose "student days" either to non-attendance at all, or to attendance in a different school district.

B. HOMELESSNESS

Unaffordable utility bills contribute to the prevalence of homelessness and, as a result, to the municipal costs associated with responding to that homelessness. According to the U.S. Conference of Mayor's 2014 survey of hunger and homelessness, 48% of the demand for homeless services in Philadelphia were being unmet.[95] The prevalence of homelessness is not without cost to the City in its capacity as a provider of municipal services.[96]

[95] U.S. Conference of Mayors (December 2014). 2014 Hunger and Homelessness Survey: A Status Report on Hunger and Homelessness in America's Cities, Conference of Mayors: Washington D.C.

[96] The Conference of Mayors reported as follows for Philadelphia: "The City of Philadelphia's Permanent Supportive Housing Clearinghouse (CH) is a consolidation of the housing resources of the social service departments in the City. The role and purpose of the CH is to provide a streamlined, single point of access to permanent supportive housing, eliminate redundancies and multiple access points, promote coordination between

According to a study by Temple University's Institute for Public Policy Studies, over five years, an average of 32 percent of the homes of residential electric customers in Philadelphia became abandoned within one year following service termination of utility services for nonpayment. The average percentage was found to be slightly lower for gas terminations: 22.4 percent. The IPPS study concluded: "The evidence linking utility terminations to abandonment is strong, consistent over a five year period and across two utilities, gas and electric. The evidence also suggests that the percentage of units which have experienced termination and become vacant increases over time."[97]

These results have been confirmed elsewhere. The most commonly cited reasons for homelessness in Colorado, for example, were loss of job and housing costs, followed by family/relationship breakup, and utility costs. Slightly more than half (53%) of the reported reasons were related to the cost of housing (housing costs, utility costs and eviction / foreclosure).[98] In a survey of residents of homeless shelters in Kentucky, among the dominant housing-related reasons for homelessness, utility terminations were cited as the cause 7.9% of the time.[99]

Nationwide, over a five year period, 14% of Energy Assistance recipients moved in with friends or family due to the inability to pay energy bills; 6% were evicted from their home or apartment due to unpaid energy bills; 4% faced home mortgage foreclose due to home energy bills.[100]

C. PUBLIC SAFETY

The unaffordability of utilities generally contributes to the municipal costs of providing public safety. Consider the following: the move to auxiliary heating sources when primary heating fuels are disconnected opens up the possibility of an associated fire risk for low-income households. While home heating equipment is no longer the ***single*** most substantial cause of

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housing and services, and manage new housing partnerships and resources. Resources are dedicated to households served by City social service agencies that have a services and a housing need, including individuals and families with mental illness, chronic substance abuse and related health disabilities, and those who are homeless or at the highest risk of homelessness. The CH began in 2012 and now includes access to eight programs, including the housing that is provided through a partnership with the Philadelphia Housing Authority."

[97] Institute for Public Policy Studies, Temple University (June 1991). An Examination of the Relationship between Utility Terminations, Housing Abandonment, and Homelessness,.

[98] Colorado Statewide Homeless Count, Summer 2006.

[99] Northern Kentucky Coalition for the Homeless (with technical assistance by Applied Information Resources), Homelessness and Low-Cost Housing in Northern Kentucky: An Analysis and a Strategic Action Plan (July 1990).

[100] National Energy Assistance Directors Association (November 2011). 2011 National Energy Assistance Survey: Final Report, APPRISE, Inc.: Princeton (NJ).

home fires, it remains *one* of the leading factors contributing to fires, as well as to fire-related injuries and deaths. In particular, portable and fixed space heaters present a risk of harm.[101]

While portable space heaters are not the major cause of home heating fires, they play a much more substantial role in deaths and injuries. Portable and fixed space heaters (and their related equipment such as fireplaces, chimneys and chimney collectors) accounted for roughly two of every three (65%) home heating fires in 1998 and three of every four (76%) associated deaths.

According to the National Fire Protection Association ("NFPA"), "not being able to afford utilities" is one of the "major factors of increased fire risks" for low-income households. That risk, which not only increases the safety risks to low-income households, but increases the costs of providing public safety to the city, involves not merely the increased incidence of home fires generally, it is associated also with the increased risk of fires being deadly. Several factors contribute to this result. The NFPA has found:

- Not being able to afford smoke detectors. "Three fifths of all home fire deaths occur in the approximately seven percent of homes without detectors." One-third of all homes with detectors that have fires have detectors that are not working.

- Not always being able to afford child care and leaving children unattended or unsupervised. Unattended children are those left completely alone with no adult or babysitter to look after them.

- Not being able to afford a telephone. "Without a telephone, the chance of a delay in alarm when reporting a fire to the fire department increases." Telephone penetration rates for households relying exclusively on public assistance for income, for example, fall to only 45%.

- Living in less fire resistant housing, as well as using less fire resistant furniture and mattresses. "Diminished financial resources prevent many families from investing in fire safety because the resources they do have usually go to other, more immediate necessities."

[101] Ahrens (June 2001). The U.S. Fire Problem Overview Report: Leading Causes and Other Patterns and Trends, at 55, National Fire Protection Association: Quincy (MA).

D. MAINTAINING PROPERTY VALUES.

One growing realization with utility affordability programs involves the extent to which such programs assist municipalities by helping to maintain local property values. While more attention has been devoted to the relationship between affordable water service than affordable home energy, the analysis remains the same. In addition to contributing to homelessness, utility nonpayment disconnections contribute to housing abandonment and reduced property values.

Consider Detroit, Michigan. Detroit was one of the cities hardest hit by the nation's foreclosure crisis. According to a Detroit Free Press analysis in 2015, "when tax foreclosures are included, more than 1 in 3 city properties have been foreclosed in the past 10 years."[102] The newspaper reported that "Detroit has had more homes foreclosed in the past 10 years than the total number of houses in several suburbs — or all of Buffalo, New York."[103] These foreclosures have led to widespread housing abandonment, which, in turn, have led to housing demolitions. Upon examining more than 65,000 properties that were foreclosed from 2005 to 2015, the Free Press found that "56 percent of mortgage foreclosures are now blighted or abandoned. Of those 36,400 homes, at least 13,000 are slated for demolition. . ."[104]

It is, however, not simply foreclosures that have befallen Detroit. Detroit has also garnered worldwide attention regarding the challenge of delivering affordable water and wastewater service to residential customers.[105] As early as 2004, the high rate of water service disconnections gained the attention of the United Nations.[106] More than a decade later, the issues

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[102] MacDonald and Kurth (June 3, 2015). "Foreclosures fuel Detroit blight, cost city $500 million." Detroit Free Press, https://www.detroitnews.com/story/news/special-reports/2015/06/03/detroit-foreclosures-risky-mortgages-cost-taxpayers/27236605.

[103] MacDonald and Kurth (June 24, 2015). "Volume of abandoned homes 'absolutely terrifying'". Detroit Free Press, https://www.detroitnews.com/story/news/special-reports/2015/05/14/detroit-abandoned-homes-volume-terrifying/27237787.

[104] Foreclosures fuel Detroit blight, *supra* note 102. This assertion is consistent with 2018 research by the Detroit Free Press. The Free Press tracked 23 homes that were lost to tax foreclosure in 2012 and 2013. According to the Free Press, "While 78 percent of the properties appeared to be occupied in 2011, according to an analysis of Google Map images, 78 percent were either abandoned, demolished or burned down this spring when the Free Press visited the properties." Gross (August 17, 2018). Detroit Real Estate Game Creates Chaos in Neighborhoods. https://www.freep.com/story/news/local/michigan/detroit/2018/08/17/detroit-home-values-real-estate/921453002/ (hereinafter Detroit Real Estate Game).

[105] Catarina de Albuquerque, United Nations Special Rapporteur of the Human Rights Council on the Human Right to Safe Drinking Water and Sanitation, Report of the Special Rapporteur on the Human Right to Safe Drinking Water and Sanitation, Mission to the United States of America, Int'l Law Comm'n, ¶ 35, U.N. Doc. A/HRC/18/33, (July 4, 2011).

[106] UN News. "In Detroit, -backed water shut-offs 'contrary to human rights,' say UN experts," 20 Oct 2004. https://news.un.org/en/story/2014/10/481542-detroit--backed-water-shut-offs-contrary-human-rights-say-un-experts *See also*, Fried, Kate. "Groups Pressure United Nations to Restore Water Service in Detroit." Food & Water Watch.

remain.[107] In March 2018, the Detroit Free Press reported that nearly 17,500 Detroit water customers were subject to the potential disconnection of service.[108] Just like mortgage foreclosures, these water shutoffs frequently cause households to lose their homes, with a resulting abandonment of the housing structure. One study found clusters of between 51 and 88 shutoffs in nine Detroit Census Block groups in 2016, with more than 100 additional Census Block groups having clusters of between 27 and 51 shutoffs that same year. This study reported that "while some of the occupants of these houses are surviving on donated water and water sharing with neighbors, a still-untold number of those houses have been vacated or abandoned."[109]

The Pennsylvania PUC routinely finds that similar results appertain in that state with respect to home energy disconnections. At the beginning of each winter heating season, Pennsylvania utilities perform a PUC-mandated "cold weather survey." According to the PUC, "the survey tracks the number of households whose heat-related utility service was terminated during the year, and who remain without service at the start of the winter."[110] The PUC explains:

June 18, 2014. http://www.foodandwaterwatch.org/news/groups-pressure-united-nations-restore-water-service-detroit.

[107] "Nationally, water and wastewater utilities face the dual challenges of: (1) generating revenues sufficient to support infrastructure development and renewal, and (2) advancing universal access to services considered essential for human health and welfare. This dichotomy is amplified by economic conditions in Detroit, making it in some senses 'ground zero' for the national water affordability challenge." City of Detroit Blue Ribbon Panel on Affordability (2016). Blue Ribbon Panel on Affordability: Final Report, at 3 (footnotes omitted), City of Detroit: Detroit (MI). That Final Report framed the issue as follows: "One of the most acute consequences of the City of Detroit's historic decline has been the growth in the number of low-income customers encountering difficulties in paying their water and sewer bills. Over the years, these problems in one of the nation's poorest large cities have led to abysmal bill-collection rates and large numbers of service disconnections." Id., at 1.

[108] Stafford (March 26, 2018). Controversial water shutoffs could hit 17,461 Detroit households, Detroit Free Press, https://www.freep.com/story/news/local/michigan/detroit/2018/03/26/more-than-17-000-detroit-households-risk-water-shutoffs/452801002/

[109] We the People of Detroit Research Collective (2016). Mapping the Water Crisis: The Dismantling of African-American Neighborhoods in Detroit, at 20 – 21, We the People of Detroit Research Collective: Detroit (MI); *see also*, Detroit Real Estate Game, *supra* note 104.

110 Pennsylvania PUC News Release (December 27, 2018). "New PUC Report Shows Continued Improvement in PA Households Starting Winter Without Heat-Related Utilities; Struggling Consumers Urged to Call About Heating Aid" (hereafter PUC 2018 Cold Weather Survey Press Release).

> As part of the survey, the utility or its representative makes four attempts to contact consumers who are known to be without heat-related utility service. The attempts may include telephone calls, letters and personal visits to the residence and are done on different days of the week and at different times of the day. If the first three contacts are unsuccessful, the PUC requests that the fourth attempt be an in-person visit to the residence.

PUC 2018 Cold Weather Survey Press Release.

> Every year, the state's electric and natural gas distribution companies under the PUC's jurisdiction are required to survey residential properties where service has been terminated and has not been reconnected during this calendar year.[111]

The PUC releases the results of the survey each December.

One reason why homes that have had service disconnected by Pennsylvania utilities lack service at the start of the winter heating season is that the homes have been abandoned subsequent to having service disconnected, and stand vacant at the time of the survey. As shown in the Table immediately below, the number of homes found to be vacant in Pennsylvania reaches between 10,000 and 15,000 homes each year.

Table 9. Total Vacant Homes at Time of Pennsylvania Cold Weather Survey After Electric or Natural Gas Service Disconnected during Year (Pennsylvania PUC)

Year of Survey	Electric	Natural Gas
2015	14,144	5,720
2016	11,653	4,232
2017	11,173	4,096
2018 (resurveyed February 2019)	11,366	3,645
2019	10,783	4,246

Given the lack of research regarding the impacts of home energy nonpayment disconnections, a special focus on the impacts that ***foreclosures*** have on surrounding housing values is merited, both because of the magnitude of the impact and because of the degree to which those impacts ***have*** been studied. The housing impacts arise in two ways. On the one hand, one of the most substantial external impacts involves the impact on the value of the home subject to foreclosure. On the other hand, there is also the impact on the values of other homes in near proximity.

As a general rule, it has been recognized that foreclosed properties have a negative impact upon neighboring home values.[112] In synthesizing "the empirical evidence measuring the effect of foreclosure on nearby property sales prices," what is generally viewed as the pre-eminent assessment of the literature reports that "the evidence is consistent" that a reduction in

[111] PUC 2018 Cold Weather Survey Press Release, *supra*.

[112] NeighborWorks America (September 2005). Effective Community-Based Strategies for Preventing Foreclosures, at 5, NeighborWorks America, Washington D.C. (citations omitted); *see also*, Apgar, Duda and Nawrocki Gorey. (February 27, 2005). The Municipal Cost of Foreclosures: A Chicago Case Study, at 10. Homeownership Preservation Foundation, Minneapolis (MN). (hereinafter, "Municipal Cost of Foreclosure").

surrounding home values occurs, although "estimates and interpretations vary."[113] The "universal findings" of relevant studies are that properties near foreclosed homes lose substantial value.[114]

This reduction in surrounding property value is substantial. One assessment in Chicago, perhaps the most cited of the various studies, found that "each new foreclosure within one-eighth mile of a home resulted in a 0.9 percent decline in the value of that home (*i.e.*, having more foreclosures results in a greater decline in value). In low and moderate-income neighborhoods. . .the marginal drop in property value from one new foreclosure in [the] same radius was 1.8 percent."[115] Similarly, a second study found "a negative effect on values of 1.3 percent within a 300-foot radius of the home (*i.e.*, a foreclosure probably in one of the nearest two to three properties), but a drop of only 0.6 percent for a one-eighth mile (660 feet) radius (*i.e.*, a foreclosure probably in the next block)."[116] To provide context, one-eighth mile represents roughly one block. One quarter mile thus represents roughly two blocks.[117]

A study by Temple University found that, in Philadelphia, properties within 150 feet of an abandoned unit sold for $7,627 less than those not located near abandoned units, with the effect tapering off to $3,543 at distances of 300-450 feet, and the impact being negligible beyond 450 feet.[118] Another study reported that "housing prices within 250 feet of a foreclosure are lowered by about 2 percent per foreclosure through the disamenity effect. . ."[119]

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[113] Frame. (2010). Estimating the Effect of Mortgage Foreclosures on Nearby Property Values: A Critical Review of the Literature, at 1, 3. Economic Review. Federal Reserve Bank of Atlanta, Atlanta (GA). (hereinafter, "Literature Review of Foreclosure Effects on Property Values"); *see also*, Bak and Hewings. (undated). Measuring Foreclosure Impact Mitigation: Evidence from the Neighborhood Stabilization Program in Chicago, at 2, 3. Regional Economics Applications Laboratory, University of Illinois, Urbana (IL). (hereinafter, "Measuring Foreclosure Impact Mitigation"); *see also*, Impacts of Foreclosures on Families and Communities, *supra* note 133, at 17. "Considerable research has demonstrated that the outcomes predicted [in reduced values of surrounding properties] predicted. . .do in fact occur."

[114] Yishen and Yezer. (July 19, 2017). Can Differences Deceive? The Case of "Foreclosure Externalities," at 9 - 10, 30.

[115] Impacts of Foreclosures on Families and Communities, *supra* note 133, at 17.

[116] Impacts of Foreclosures on Families and Communities, *supra* note 133, at 17; *see also*, Municipal Cost of Foreclosure, *supra* note 112, at 2 (documents "indirect effects" on nearby property owners in the form of reduced property values or home equity of as much as an additional $200,000).

[117] Literature Review of Foreclosure Effects on Property Values, *supra* note 113, at 6.

[118] Municipal Cost of Foreclosure, *supra* note 112, at 28, 54; *see also*, Apgar and Duda. (May 11, 2005). Collateral Damage: The Municipal Impact of Today's Mortgage Foreclosure Boom, at 23, Homeownership Preservation Foundation, Minneapolis (MN). (hereinafter, "Collateral Damage").

[119] Impact of Foreclosures on Housing Market, *supra* note 136, at 3. Some neighborhoods and communities are known for their good neighborhood parks or excellent school systems. These neighborhood attributes are known as "amenities." In contrast, the presence of a foreclosure is seen as a neighborhood "disamenity." "Disamenity effects are a source of the negative impacts of foreclosures on their neighbors . . .[F]oreclosed properties do have a negative externality on nearby property values due to its disamenity effects. . ." Measuring Foreclosure Impact Mitigation, supra note 113, at 1, 4. Those neighborhoods having substantial numbers of foreclosures "face additional social stigma," making it difficult for residents to refinance or to sell their homes. Anne Martin. (December 9, 2010).

While the percentages may seem small, the overall dollar loss from any single foreclosure generating these losses can be quite substantial.[120] One researcher applied the Immergluck and Smith results[121] to their particular community, finding that that study:

> reports a reduction of 0.9 percent of value for all properties within one-eighth of a mile. Given that there are 31.4 acres in a radius of one-eighth of a mile and a reasonable density is 3 units per acre, this effect would extend [to] 94 properties. For example, if the average sales price were $171,000, then the aggregate externality would be $144,750 per foreclosed home.[122]

What the research shows, in other words, is that a concentrated rate of foreclosures "can put downward pressure on area property values and indirectly rob area homeowners of hundreds of thousands of dollars of home equity."[123] However calculated, it is evident that the total economic costs of a particular foreclosure would substantially exceed the costs to individual homeowners once the reduction in property values is taken into account.

Several attributes of this reduction in surrounding home values make the impact even more substantial. It is becoming increasingly clear that foreclosures tend to "cluster."[124] A Brookings Institution study of foreclosures in Columbus (OH), for example, documented areas of such foreclosure clustering. "These [clusters] are today most often the areas which have already been

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After Foreclosure: The Displacement Crisis and the Social and Spatial Reproduction of Inequality, at 6. Institute for the Study of Social Change, Department of City and Regional Planning, University of California, Berkeley, Berkeley (CA). (hereinafter, "The Displacement Crisis").

[120] Thaden and Rosenberg. (October 2010). Outperforming the Market: Delinquency and Foreclosure Rates in Community Land Trusts, at 3. Land Lines, Lincoln Institute of Land Policy, Cambridge (MA). ("The costs of foreclosure extend well beyond the households that lose their homes, impacting the immediate neighborhood and surrounding municipality. Studies in Columbus (Ohio), Chicago, and New York City have shown that foreclosed properties significant diminished nearby housing values, and that rates of depreciation were greater for lower-income than higher-income neighborhoods.") (hereinafter, "Outperforming the Market").

[121] *See*, Immergluck and Smith. (2006). The External Costs of Foreclosure: The Impact of Single-Family Mortgage Foreclosures on Property Values. Housing Policy Debate 17(1):57-79, at 75. (hereinafter, "Impact on Property Values").

[122] U.S. Department of Housing and Urban Development (March 2011). Regulatory Impact Analysis: Emergency Homeowners' Loan Program, at 4. U.S. Department of Housing and Urban Development, Washington D.C. (hereinafter "Regulatory Impact Analysis").

[123] Municipal Cost of Foreclosure, *supra* note 112, at 1.

[124] Outperforming the Market, *supra* note 120, at 3 ("Foreclosures, which are associated with rises in vacant properties and crime, tend to cluster in low-income and minority neighborhoods.")

severely destabilized, or are at risk of future destabilization."[125] Similar clustering of water shutoffs was described above.[126]

One cause identified for this clustering, known as the "contagion effect," is that one foreclosure tends to lead to another and then to another.[127] "Analysis by Collins (2003) suggests that there is a 'contagion' effect, demonstrating that foreclosures in some Chicago neighborhoods have tended to cluster, positing that a number of geographically concentrated foreclosures may cause additional foreclosures in that area."[128] In fact, this contagion effect counsels that each loan failure increases the likelihood of another.[129] This "contagion effect" can "ripple through the local economy."[130]

Several factors contribute to the clustering and contagion effect. One factor increasing clustering is that as more homeowners default, the stigma associated with such default is lessened.[131] This enables additional homeowners to subsequently default.[132] Each additional five distress sales per 10,000 households raises the re-default risk by 6.7 percent.

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[125] Mallach (June 2009). Addressing Ohio's Foreclosure Crisis: Taking the Next Steps, at 4. Metropolitan Policy Program at Brookings Institution, Washington D.C. (hereinafter, "Ohio's Foreclosure Crisis").; Municipal Cost of Foreclosure, *supra* note 112, at 2, 13; *see also*, Duda and Apgar (July 2004). Mortgage Foreclosure Trends in Los Angeles: Patterns and Policy Issues (foreclosures tend to cluster in low-income and/or minority neighborhoods with many of the "outsider" effects thus concentrated among the nation's most vulnerable households).

[126] *See*, notes 108 - 109, *supra*, and accompanying text.

[127] Municipal Cost of Foreclosure, *supra* note 112, at 14.

[128]Community-Based Strategies, *supra* note 112, at 8; *see also* Collateral Damage, *supra* note 118, at 5 (references "contagion" of foreclosures).

[129] Collateral Damage, *supra* note 118, at 9 (citing, Collins, Michael (2003). Chicago's Home Ownership Preservation Challenge: Foreclosures. Presentation to the Federal Reserve Bank of Chicago); *see also*, Municipal Cost of Foreclosure, *supra* note 112, at 10 (the extent that one foreclosure makes subsequent foreclosures on nearby loans more likely is known as "foreclosure contagion").

[130] Federal Housing Finance Agency. (July 25, 2016). Guiding Principles for the Future of Loss Mitigation: How the Lessons Learned from the Financial Crisis Can Influence the Path Forward, at 4. Federal Housing Finance Agency, Washington D.C. (hereinafter "Guiding Principles").

[131] Second Chances, *supra* note 132, at 22.

[132] "A growing concern is that the 'stigma' to a borrower from a default may be reduced in areas experiencing a severe shock to the local housing market. If several houses along a street are in foreclosure, then neighbors may not be surprised to hear about another neighbor defaulting on their mortgage, and may ascribe the decision to general problems in the housing market rather than any specific issues with their neighbor. In addition, neighbors who have defaulted themselves or who know someone who has defaulted may urge their friends to do the same if they are facing either payment problems or are in a negative equity situation. Uncertainty of what will happen to a borrower if he/she defaults may be reduced from conversations from friends or neighbors who have already gone through the process." Haughwout, Okay and Tracy (August 2010). Second Chances: Subprime Mortgage Modification and Re-Default, at 21 -22, Federal Reserve Bank of New York (hereinafter "Second Chances"), citing Fannie Mae Foundation (August 2010). The Fannie Mae National Housing Survey (borrowers who know someone who has experienced a foreclosure are more than twice as likely to seriously consider default as those who do not).

When mortgage foreclosures start to multiply, the adverse economic costs generated become greater and greater.[133] A single foreclosure in an "otherwise economically healthy neighborhood" is "certainly a negative factor" but as the number of foreclosures in a single area mount, the negative consequences are likely to increase disproportionately.[134] This is particularly true in low-income neighborhoods.[135]

This occurs because the decline in nearby property values resulting from a foreclosure is additive. "While a 1 percent drop in housing prices may not seem terribly large, it can become hefty, since this effect increases with the number of foreclosures. If there were five foreclosures in the same vicinity, for instance, the discount would be around 5 percent."[136] One study in Philadelphia found that "foreclosures decrease nearby property values, and that the number of foreclosures influences the size of that decline. For example, within one year. . .while two foreclosures within an eighth of a mile reduce house values by 5 percent, 20 foreclosures reduce the value by about 18 percent."[137]

These findings related to the impact of mortgage foreclosures directly apply to utility nonpayment service disconnections as well. Returning to the data from Detroit, unlike in the home mortgage industry, the Detroit Water and Sewerage Department ("DWSD") has never studied the impact of service disconnections, either individually or as they may tend to cluster, on the value of the home directly affected or on the value of homes in close proximity thereto. Nevertheless, DWSD has made some efforts to identify homes that have not had service reconnected subsequent to a termination of service for nonpayment, as well as to identify homes that have been vacated subsequent to a termination of service. Over a five month period in 2018 (May through September), DWSD tracked the number of disconnect notices issued, the number

[133] Kingsley, Smith and Price. (May 2009). The Impacts of Foreclosures on Families and Communities, at 34. The Urban Institute, Washington D.C. (hereinafter, "Impacts of Foreclosures on Families and Communities"); *see also*, Municipal Cost of Foreclosure, *supra* note 112, at 28 ("As the number of foreclosures in a single area mounts. . .the negative consequences increase rapidly.").

[134] Municipal Cost of Foreclosure, *supra* note 112, at 55; *see also*, Schwartz, Ellen, Voicu and Schill (2003). Estimating the External Effect of Subsidized Housing Investments on Property Values. A paper prepared for the Federal Reserve System Conference on Sustainable Community Development; *see also*, Second Chances, *supra* note 132, at 21 – 22.

[135] "In a weak market neighborhood, where property values may be going down already, even a small number of foreclosures are likely to accelerate the trend, and a higher density of them would do so yet more rapidly." Impacts of Foreclosures on Families and Communities, *supra* note 133, at 16.

[136] Hartley. (October 27, 2010). The Impact of Foreclosures on the Housing Market. Economic Commentary, at 1. Federal Reserve Bank of Cleveland, Cleveland (OH). (hereinafter, "Impact of Foreclosures on Housing Market").

[137] Prescott (September 1, 2008). Synopses of Selected Research on Housing, Mortgages, and Foreclosures, at 86, Homeownership and Mortgage Initiatives, Research Subcommittee, Federal Reserve System, Washington D.C. (hereinafter "Synopses of Selected Research"). Indeed, there may even be a "tipping point" at which values reduce sharply, but where, if at all, that point occurs has not been conclusively established. Synopses of Selected Research, *supra*, at 89.

of "service interruptions" actually performed, the number of service reconnections made subsequent to disconnection, and the number of vacated homes existing after a service disconnection.[138] DWSD reported that, during that five month period, it "completed" 11,422 service disconnections for residential customers. Moreover, DWSD said, it "restored" service to 7,885 customers during that same time period, meaning that 3,537 customers had water service disconnected without a subsequent service restoration. DWSD reported that it had "verified" 631 vacated properties.[139] Nearly 20% of the homes to which utility service was disconnected, but not reconnected, had been "verified" as having been vacated.

As discussed above, a similar relationship between home energy shutoffs and housing abandonment has been documented in Pennsylvania generally, and in Philadelphia specifically. As found in the research on the impacts of foreclosures on property values, what results in the property value decline is the extent to which foreclosures result in housing abandonment. Homes that are vacated subsequent to a utility service disconnection can be expected to experience similar property value declines akin to properties vacated due to mortgage foreclosures. Moreover, properties vacated due to utility disconnections will have similar impact on declining property values for neighboring homes to the detriment of Connecticut municipalities.

[138] Service Interruption Summary, File No. 18-0237, DWSD Customer Service Committee, DWSD Board of Water Commissioners (October 3, 2018) (data as of September 28, 2018). https://dwsd.legistar.com/MeetingDetail.aspx?ID=617807&GUID=DBA3DFFF-69D8-4D3E-B7D8-4B209A996F08&Options=info&Search=.

[139] There is much lacking in this report. DWSD does not explain how it "verified" whether a property was vacated. Nor is there information on whether a property was vacated before or after a shutoff. Perhaps most significantly, however, DWSD does not report whether properties outside of the 631 "verified" vacated properties were not vacated, or whether there was simply insufficient information to verify whether the property was vacated or not.

Part 5. COVID-19 Impacts.

The discussion which follows in this section considers the impacts of the COVID-19 pandemic on utility customers. In responding to the COVID-19 pandemic, Connecticut utilities should take into account the extent to which the health pandemic has resulted in an economic crisis that adversely affects its customers. The immediate health emergency today facing the United States and Connecticut also results in serious economic consequences. While the COVID-19 pandemic strengthens the need for immediate utility bill affordability relief, however, such relief is not dependent on the impacts of the pandemic.

A. THE COVID-19 IMPACT TO LOW- AND MODERATE-WAGE WORKERS.

While the COVID-19 pandemic is obviously a critical public health crisis to the general population, it presents a ***particular*** health and economic crisis to the working poor. The discussion below focuses on the disproportionate COVID-19 impacts on lower-income employment. There is substantial research that explains the disproportionate adverse impact on low-wage workers.

As of mid-March 2020, more than 90 percent of the jobs lost due to COVID-19 were in low-wage industries, particularly in the accommodations and food services industries.[140] The loss of

[140] Boushey and Park (April 2020). The coronavirus recession and economic inequality, at 13, Washington Center for Equitable Growth (available at https://equitablegrowth.org/the-coronavirus-recession-and-economic-inequality-a-roadmap-to-recovery-and-long-term-structural-change/, November 11, 2020), citing U.S. Bureau of Labor

income, however, is not limited exclusively to the loss of employment. As the Urban Institute reports, based on its Health Reform Monitoring Survey (HRMS), conducted between March 25 and April 10, 2020, the health pandemic also results in a reduction in work hours even if jobs remain:

> Though the rise in unemployment insurance claims suggests the unemployment rate has soared over the past month, the official rate will likely understate the negative effects of the pandemic on families, because it will not account for reductions in work hours or work-related income (*e.g.*, reduced business income) that are not connected to job losses. . .[W]e find that 41.5 percent of nonelderly adults reported that the coronavirus outbreak has had one or more of the following effects on their work or the work of someone in their family: losing or being laid off from a job (17.1 percent), being furloughed or having work hours reduced (28.8 percent), or losing earnings or income from a job or business (27.8 percent).[141]

According to the Urban Institute, "[t]he finding that about 4 in 10 adults were in families that lost work or work-related income is consistent with results from recent surveys and polls conducted by the Henry J. Kaiser Family Foundation (March 25–30), Pew Research Center (April 7–12), and Monmouth University Polling Institute (April 3–7)."[142] The Urban Institute's research, supported by the Robert Woods Johnson Foundation, reported further that:

> About half of adults in families with incomes at or below poverty (51.1 percent) or between 100 and 250 percent of FPL (49.0 percent) reported that their families lost jobs, work hours, or work-related incomes because of the coronavirus outbreak […]. In contrast, just under one-third (32.2 percent) of adults in families with incomes at or above 400 percent of FPL reported job or income losses because of the outbreak.[143]

Statistics, "Current Employment Statistics Highlights (2020), available at www.bls.gov/web/empsit/ceshighlights.pdf.

[141] Karpman, *et al.* (April 2020). The COVID-19 Pandemic is Straining Families' Abilities to Afford Basic Needs, at 5, Urban Institute Health Policy Center: Washington D.C., available at https://www.urban.org/research/publication/covid-19-pandemic-straining-families-abilities-afford-basic-needs.

[142] Kirzinger, Kearney, Hamel, and Brodie, "KFF Health Tracking Poll – Early April 2020: The Impact of Coronavirus on Life in America," Henry J. Kaiser Family Foundation, April 2, 2020, https://www.kff.org/health-reform/report/kff-health-tracking-poll-early-april-2020/; Parker, Horowitz and Brown, About Half of Lower-Income Americans Report Household Job or Wage Loss Due to COVID-19, Pew Research Center, April 21, 2020, https://www.pewsocialtrends.org/2020/04/21/about-half-of-lower-income-americans-report-household-job-or-wage-loss-due-to-COVID-19/; "COVID-19 Impact on Daily Life Heightens," Monmouth University Polling Institute, April 13, 2020, https://www.monmouth.edu/polling-institute/reports/monmouthpoll_us_041320/.

[143] Id., at 6.

These numbers are consistent throughout research performed nationwide. The Pew Research Center, one of the nation's most respected research centers, *also* reported that:

> lower-income adults are more likely than middle- and upper-income adults to say they've experienced significant job disruption due to the coronavirus outbreak. About half of lower-income adults (52%) say they or someone in their household has lost a job or taken a cut in pay due to the outbreak. This compares with 42% of middle-income and 32% of upper-income adults.[144]

The Pew data is set forth in the Table below.

Table 10. More than four-in-ten adults say they or someone in their household has lost a job or taken a pay cut due to COVID-19 (Pew Research Center)

	Been laid off / lost job	Had to take cut in pay	Net either / both
Upper income	18%	26%	32%
Middle income	26%	32%	42%
Lower income	39%	41%	52%

One reason why low wage workers are so adversely affected is because they are far less likely to report being able to work from home than the highest-income group of workers (17.1% versus 54.6%).[145] Just under one-third of American workers stated that they could work from home - including those workers who were simply bringing their work home with them - according to the American Time Use Survey.[146] Even fewer workers—just 12%—actually did work from home at least once per month.[147] These numbers are far lower for those in the bottom quartile of workers: only 9% could work from home, and just 1% worked from home at least once per month.[148] Most workers do not have access to a flexible workplace that would permit them to work an agreed-upon portion of their schedule at home, but those in the bottom 10% of income are the least likely while the highest-paid workers are the most likely.

[144] Parker, Horowitz and Brown (April 21, 2020). About Half of Lower-Income Americans Report Household Job or Wage Loss Due to COVID-19," at 7, Pew Research Center: Washington D.C. , available at https://www.pewsocialtrends.org/2020/04/21/about-half-of-lower-income-americans-report-household-job-or-wage-loss-due-to-covid-19/.

[145] Urban Institute, at 7.

[146] Table 1. Workers Who Could Work at Home, Did Work at Home, and Were Paid for Work at Home, by Selected Characteristics, Averages for the Period 2017-2018. U.S. Bureau of Labor Statistics, U.S. Bureau of Labor Statistics, 24 Sept. 2019, available at: www.bls.gov/news.release/flex2.t01.htm.

[147] Guyot, and Sawhill. "Telecommuting Will Likely Continue Long after the Pandemic." Brookings Institution, 6 Apr. 2020,available at: www.brookings.edu/blog/up-front/2020/04/06/telecommuting-will-likely-continue-long-after-the-pandemic/.

[148] Id.

Loss of income arises, too, when the families of low-wage workers fall ill. Low-wage workers tend not to have paid leave, including paid sick leave, personal leave, or paid "vacation" time. Accordingly, when household members become ill, requiring caretakers to take time off, these households permanently lose income. Fewer than one-third of low-wage workers have access to paid leave at their place of work, as compared to 94% of those in the top 10% of income.

This disproportionate exposure to becoming ill is not theoretical. It is well-established that those low-wage workers who do remain employed will likely be employed in high-risk jobs. Common occupations for low-wage workers include cashiers and retail salespersons, people who re-stock retail establishments and/or prepare orders for fulfillment, and others who have constant, close contact with the public (*e.g.*, delivery people, drivers/truck drivers). Following the Bureau of Labor Statistics' National Compensation Survey, service occupations include health care support, protective service, food preparation, building and grounds, cleaning and maintenance, and personal care. These workers are at risk of exposure to the coronavirus due to the inherent person-to-person nature of their work, which also makes it nearly impossible for these service occupation employees to work from home. In 2019, just 1% of all workers in service occupations had access to a flexible workplace, which would allow them to complete their work at home or at an approved alternative location. As the vice-chair of the Congressional Joint Economic Committee noted, "without options for paid sick leave and working from home, workers in the service occupations are at risk of contracting and spreading the virus from sick co-workers and customers, and of bringing it home to their families."[149]

In addition to those actually becoming ill, the people who are most severely economically disadvantaged from becoming ill due to COVID-19 involve wage workers. Most low-wage workers lack paid benefits such as health insurance. According to the U.S. Bureau of Labor Statistics, only 24% of workers in the private sector in the lowest 10% wage category had access to employer-sponsored health care plans in 2019.[150] Moreover, COVID-19 is making this situation worse. In March-April 2020, 9.2 million workers may have lost their employer-provided health insurance as a result of COVID-19, with those losses highly concentrated in the accommodation and food services industry.[151]

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[149] Congressman Don Beyer, Vice Chair, Congressional Joint Economic Committee, The Impact of Corona Virus on the Working Poor and People of Color, at 4, available at: https://www.jec.senate.gov/public/_cache/files/bbaf9c9f-1a8c-45b3-816c-1415a2c1ffee/coronavirus-race-and-class-jec-final.pdf.

[150] Employee Benefits in the United States, March 2019.U.S. Bureau of Labor Statistics, National Compensation Survey (NCS) 2019. available at: https://www.bls.gov/ncs/ebs/benefits/2019/employee-benefits-in-the-united-states-march-2019.pdf.

[151] Economic Policy Institute (April 16, 2020) (updated May 14, 2020). 9.2 million workers likely lost their employer-provided health insurance in the past four weeks, available at: https://www.epi.org/blog/9-2-million-workers-likely-lost-their-employer-provided-health-insurance-in-the-past-four-weeks/.

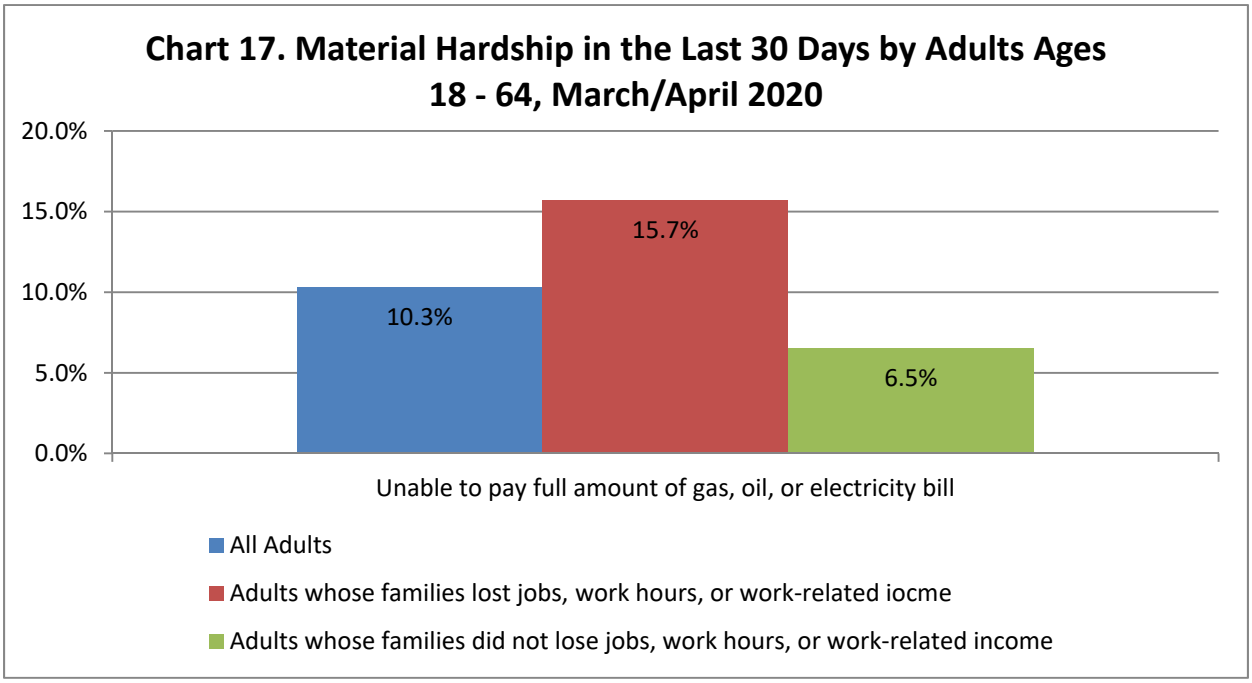
B. THE IMPACT OF ECONOMIC DISRUPTION ON ABILITY-TO-PAY UTILITY BILLS.

It is possible to quantify the extent to which the income loss discussed above, whether due to lost jobs or reduced incomes, affects a household's ability-to-pay utility bills. The Urban Institute, previously cited, examined the growth in "material hardships" attributable to COVID-19. The Urban Institute defines a "material hardship" as:

> being unable to pay their rent or mortgage, being unable to pay utility bills, reporting house-hold food insecurity, or having someone in the family go without medical care because of the cost. As noted, 31.0 percent of all adults and 42.0 percent of adults in families experiencing a loss of work or work-related income because of the pandemic reported that their families faced at least one type of hardship in the month before they completed the survey. This included 8.1 percent of adults whose households did not pay the full amount of the rent or mortgage or were late with such a payment; 10.3 percent who did not pay gas, oil, or electricity bills; 21.9 percent reporting household food insecurity; and 15.6 percent with unmet needs for medical care. These estimates likely understate housing hardship, because about three-quarters of respondents completed the survey before rent was due on April 1.
>
> Among adults in families that lost work or work-related income, the shares reporting each type of hardship were significantly higher than such shares among adults in families that have not lost work or income. Nearly one in three (29.6 percent) adults in families that lost work or income reported food insecurity for their household in the last 30 days, nearly twice the share of adults in families not losing work or income who reported food insecurity (16.3 percent). Food insecurity was the most commonly reported hardship among all adults and those in families that lost work or income, and that food insecurity occurred during a period when people were being encouraged to stock up on food and limit trips to grocery stores.
>
> * * *
>
> The share of adults reporting hardship falls sharply as family income increases: whereas more than two-thirds (68.6 percent) of adults with family incomes at or below poverty reported one or more hardships, 10.7 percent of adults with incomes at or above 400 percent of FPL reported hardship.[152]

[152] Urban Institute, *supra*, at 10, 11.

Not surprisingly, the burden of material hardships attributable to COVID-19 fell hardest on adults whose families lost jobs, work hours, or work-related income.



As noted above, there is a substantial overlap between those adults and households who lost jobs or income and those households with lower income with which to begin. The Urban Institute further found the burden of increased material hardship fell overwhelmingly on the poor. With unpaid utility bills in particular, while 27.5% of consumers with income less than 100% of Poverty were unable to pay home energy bills, only 8.2% of families with income between 250% and 400% of Poverty, and only 2.6% of families with income greater than 400% of Poverty, were unable to do so.[153]

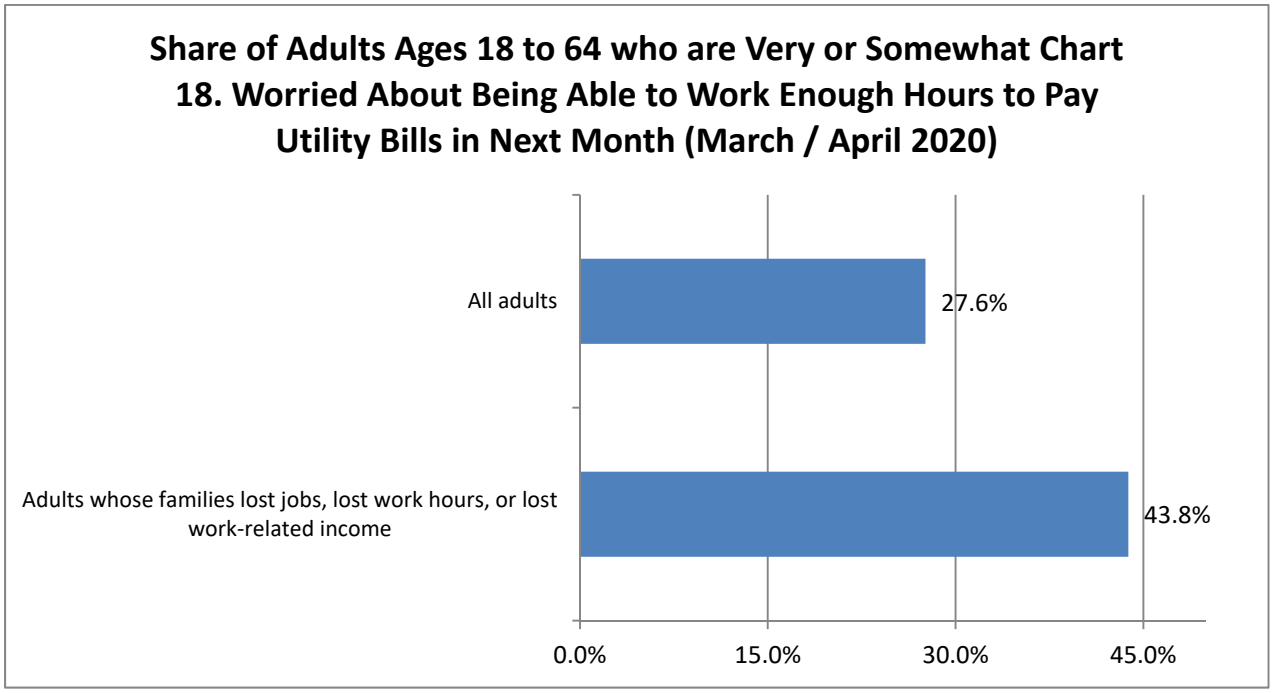
Table 11. Material Hardship in the Last 30 Day Reported by Adults Age 18 to 64, By Family Income (Federal Poverty Level), March/April 2020

	Family Income			
	At or below 100% FPL	100 – 250% FPL	250 – 400% FPL	400% FPL or more
Unable to pay full amount of gas, oil or electricity bills	27.5%	13.9%	8.2%	2.6%

There are COVID-19 impacts beyond actually *missing* a utility bill payment. The discussion above presented data on the percentage of households who have failed to make utility bill

[153] The Poverty Level ranges reported here are those used in the report, not those which have been developed for this paper.

payments. In addition, that same study documented the percentage of households who *worry* about their ability to work sufficient hours to be able to pay their utility bills each month. "Among adults in families that lost work or income," the Urban Institute found, over half (50.6 percent) were "*worried about* being able to pay debts, and many also worried about being able to pay. . . utility bills (43.8 percent). . .*in the next month*. These data suggest that in addition to those who have already had problems paying their bills, a large share of adults in families losing work or income were *newly* at risk of falling behind on the rent, mortgage, or utility bills. . ."[154] (emphasis added).

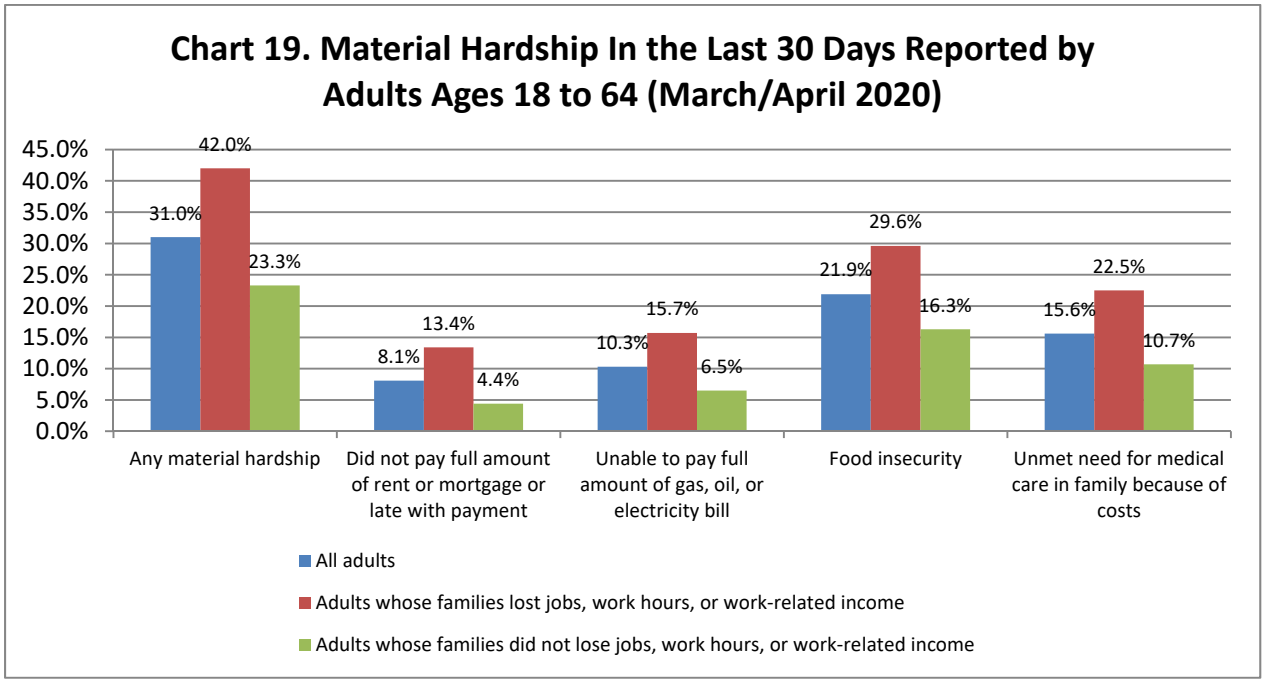


The presence of low wage workers who are "worried about" being able to make payments is of significance. As can be seen, customers are aware of their payment obligations, and have sufficient intent to pay those obligations that they are "very or somewhat worried about" whether their household will have sufficient resources to make those payments. If people had the ability to pay, but simply did not intend to do so, they would not report being "worried about" having sufficient resources.

In fact, customers have continued to make good faith efforts to pay their utility bills during the COVID-19 pandemic. The problems identified above arise despite the fact that customers choose to pay their utility bills during the pandemic, where possible, even if that payment is at the cost of *not* paying for food and/or shelter. The Urban Institute study discussed above illuminates the choices that households are being forced to make in today's COVID-19 pandemic

[154] Urban Institute, *supra*, at 14.

world. The Chart immediately below shows those choices that people are making. As documented above, one-in-six (15.7%) of adults are unable to pay their home energy bills when they lost jobs, or suffered lost work hours or reductions in work-related income. That number, however, does not tell the full story. Nearly one-in-three (29.6%) of adults who lost jobs/income experienced food insecurity, while nearly one-in-four (22.5%) were unable to received medical care for someone in their family because of cost. There are, in other words, people who are choosing to pay their utility bills *before* they are buying food or obtaining health care in the midst of the worst public health crisis in more than 100 years.



The March/April 2020 data is still relevant even as Connecticut moves into 2021. Simply because the data above was generated in the "early" months of the pandemic does not mean that the information (and lessons to be learned from the information) is now outdated. Table 12 below shows, for Connecticut specifically, that neither the loss of employment income nor the expected loss of employment income, has reversed from the first week of the Census Pulse Survey to the most recent (Week 20) of the Pulse Survey. Moreover, the disparity in employment outcomes (and expected outcomes) has remained the same (and perhaps even become somewhat more exacerbated) between Week 1 and Week 23. The information presented above helps to explain what is going on, and why. The data and conclusions have certainly not become out-of-date.

Table 12. Employment. Experienced and Expected Loss of Employment Income, by Select Characteristics: Connecticut

	Week 1 (April 23 – May 5)				Week 23 (January 20, 2021 – February 1, 2021)			
	Experienced loss of employment income since March 13, 2020 (for self or household member)		Expected loss of employment income in next 4-weeks (for self or household member)		Experienced loss of employment income since March 13, 2020 (for self or household member)		Expected loss of employment income in next 4-weeks (for self or household member)	
	Yes	No	Yes	No	Yes	No	Yes	No
Less than $25,000	61%	39%	66%	34%	54%	46%	29%	71%
$25,000 - $34,999	47%	53%	46%	54%	53%	47%	24%	76%
$35,000 - $49,999	47%	53%	35%	63%	48%	52%	28%	72%
$50,000 - $74,999	65%	35%	46%	54%	38%	62%	24%	76%
$75,000 - $99,999	30%	69%	32%	67%	47%	53%	29%	71%
$100,000 - $149,999	41%	59%	38%	61%	44%	56%	22%	78%
$150,000 - $199,999	41%	59%	37%	63%	34%	66%	15%	85%
$200,000 and above	28%	72%	19%	81%	23%	77%	5%	95%

The "experienced loss of employment income" is down somewhat in the lowest income category (*i.e.*, 61% to 54% for income less than $25,000), but is up by about the same amount in the next income category (*i.e.*, 47% to 53% for income at $25,000 to $34,999). The experienced loss of income is nearly identical for the third income range (47% vs. 48% for income of $35,000 to $49,999). The "experienced loss of employment income" is reasonably consistent for all other income categories.

What *has* improved is the "expected loss of employment income in the next four weeks." That expectation of the loss of employment income has substantially decreased in all income categories.

C. THE LONG-TERM ECONOMIC IMPACTS OF COVID-19.

COVID-19 is expected to have long-term economic consequences to the low wage population. The COVID-19 pandemic imposes two distinctly different crises to utility customers in Connecticut. On the one hand, there is the public health crisis. On the other hand, however, there is the associated economic crisis. The economic impacts of the COVID-19 pandemic may

persist for years to come and any utility response to this economic crisis should take this long-term nature into account.

It should be recognized that the economic crisis which is associated with the COVID-19 pandemic will not be resolved when there is a publicly available vaccine. The economic impacts will result in a long-term economic disruption for utility customers in Connecticut.

The resolution of the COVID-19 health crisis will not end the economic crisis facing low-income customers. One analysis by the Center on Poverty and Social Policy at Columbia University projects the longer-term effects of the COVID-19 economic crisis.[155] The Columbia University research center forecasted poverty rates under three alternative unemployment scenarios: 10 percent, 20 percent, and 30 percent. The Center assumed that such high levels of unemployment lasted for two different scenarios: (1) one quarter, and (2) one year. The Center uses the "Supplemental Poverty Measure" (SPM), which differs somewhat from the Federal Poverty Level.[156]

The Center began with a projected SPM of 12.4% in February 2020, the lowest recorded poverty rate since 2001. Its projected poverty rates after the onset of the COVID-19 pandemic, however:

> point to higher poverty rates today. If unemployment rates rise to 10 percent, comparable to the unemployment rate during the peak of the Great Recession, we project that poverty rates would rise to 15 percent. This is approximately the same rate of poverty observed in 2010. (note omitted). If unemployment rates rise to 20 percent, we project a poverty rate of 16.9 percent—the highest rate of poverty since 1967, the first year for which reliable estimates of poverty are available. Finally, if annual unemployment rates rise to 30 percent, we project a poverty rate of 18.9 percent. This would mark the highest rate of poverty over the past 50 years.[157]

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[155] Parolin and Wimer (April 16, 2020). Forecasting Estimates of Poverty During the COVID-19 Crisis: Poverty Rates in the United States Could Reach Highest Levels in Over 50 Year, available at https://www.povertycenter.columbia.edu/news-internal/coronavirus-forecasting-poverty-estimates.

[156] In simplified terms, the Census Bureau explains that the Supplemental Poverty Measure, "takes into account family resources and expenses not included in the official measure as well as geographic variation. First, it adds the value of in-kind benefits that are available to buy basic goods to cash income. In-kind benefits include nutritional assistance, subsidized housing and home energy assistance. Then it subtracts necessary expenses for critical goods and services not included in the thresholds from resources. Necessary expenses that are subtracted include income taxes, Social Security payroll taxes, child care and other work-related expenses, child support payments to another household, and contributions toward the cost of medical care and health insurance premiums." What is the Supplemental Poverty Measure and How Does it Differ from the Official Measure, available at, https://www.census.gov/newsroom/blogs/random-samplings/2018/09/what_is_the_suppleme.html.

[157] Id., at 4 - 5.

Two observations are appropriate. On the one hand, unemployment in Connecticut did not reach the 20% or 30% levels represented by the two upper ranges in this analysis. Accordingly, the 20% and 30% unemployment scenarios are set aside for this discussion. Even with this lowest scenario, the Center stated: "under an optimistic scenario, in which employment rates return to pre-crisis levels during the summer of 2020, annual SPM poverty rates are still projected to reach levels comparable to the Great Recession."[158] On the other hand, employment rates did *not* return to the pre-crisis levels in the summer of 2020.

This increase in Poverty is important because it is not likely to be resolved in the short-term. The long-term danger arises because when people lose their jobs, the long-lasting effects are not just on their income. Unemployment has a negative effect on workers' skills and education, even on their health—people who are unemployed become sicker. Human capital, the skills of the overall workforce, decays over time because of the loss of jobs. Moreover, with the COVID-19 pandemic, it is generally recognized that many of the jobs that have been lost will never come back. One recent research paper from the Becker Freidman Institute for Economics at the University of Chicago estimates that between 32% and 42% of COVID-19 induced layoffs will be permanent.[159]

COVID-19 has generated a second adverse economic impact as well for low wage utility customers. Nearly 40% of U.S. households, including nearly all low-wage workers, fall into a category referred to as "liquid asset poor." "Liquid asset poverty," which is interchangeable with "liquid asset poor," is a term-of-art that refers to households who lack sufficient liquid assets to replace income in order to subsist at the Poverty Level for three months in the absence of income. According to a Pew Research Center report, "only about one-in-four (23%) [lower income adults] say they have rainy day funds set aside that would cover their expenses for three months in case of an emergency such as job loss, sickness or an economic downturn, compared with 48% of middle-income and 75% of upper-income adults." [160]

As the COVID-19 economic crisis moves into a more prolonged period, the impact of the lack of savings will become increasingly pronounced., Low-income customers, in particular, will be unable to draw on resources to pay day-to-day bills. A Pew Research Center study published in late September reported that half of all adults who said they had lost a job due to the coronavirus were still unemployed "roughly six months since the coronavirus outbreak sent shockwaves

[158] Forecasting Estimates of Poverty, *supra* note 155, at 9.
[159] Davis, *et al.* (June 2020). COVID-19 is also a Reallocation Shock, available at: https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202059.pdf.
[160] Parker, Horowitz and Brown (April 21, 2020). About Half of Lower-Income Americans Report Household Job or Wage Loss Due to COVID-19, Pew Research Center: Washington D.C. Available at https://www.pewsocialtrends.org/2020/04/21/about-half-of-lower-income-americans-report-household-job-or-wage-loss-due-to-covid-19/.

through the U.S. economy."[161] Moreover, according to Pew, even those who did not lose their job, but who nonetheless lost income, were still in bad economic shape. Pew reported:

> Of those who say they personally lost a job, half say they are still unemployed, a third have returned to their old job and 15% are in a different job than before. Lower-income adults who were laid off due to the coronavirus are less likely to be working now than middle- and upper-income adults who lost their jobs (43% vs. 58%). Adults ages 18 to 29 are less likely than those 30 to 64 to have returned to their previous job.
>
> Even if they didn't lose a job, many workers have had to reduce their hours or take a pay cut due to the economic fallout from the pandemic. About a third of all adults (32%) say this has happened to them or someone in their household, with 21% saying this happened to them personally. Most workers who've experienced this (60%) are earning less now than they were before the coronavirus outbreak, while 34% say they are earning the same now as they were before the outbreak and only 6% say they are earning more.[162]

Pew continues, however, to note that "lower-income adults who lost their jobs because of the coronavirus outbreak are more likely than those with middle or upper incomes to remain unemployed. Some 56% of workers with lower incomes who lost their job because of the coronavirus outbreak say they are currently unemployed, compared with 42% of middle- and upper-income adults."[163]

This long-term job loss is significant because one of the long-term economic implications of the job loss and other loss of income is just now becoming more evident. Economic difficulties, particularly for lower-income households, will prevail for an extended period of time not only because these households have been forced to use their emergency savings, but also because they have been forced to incur substantial debt during the COVID-19 pandemic to date. According to Pew:

> Those affected by coronavirus related job loss or pay cuts are much more likely than those who have not experienced these setbacks to have drawn on additional resources. Fully 46% of adults who say they or someone in their household have either been laid off or taken a pay cut as a result of the coronavirus outbreak say

[161] Parker, Minkin and Bennett (September 24, 2020). Economic Fallout from COVID-19 Continues to Hit Lower-Income Americans the Hardest, at 1, Pew Research Center (Washington D.C.). (hereafter COVID-19 Economic Fallout), https://www.pewsocialtrends.org/2020/09/24/economic-fallout-from-covid-19-continues-to-hit-lower-income-americans-the-hardest/.
[162] Id., at 5, 7, 8.
[163] Id., at 7 – 8.

> they have used money from a savings or retirement account to pay their bills, compared with 17% of those who have not experienced these setbacks.[164]

As the COVID-19 economic crisis continues, these households are now running out of savings to draw down. A Bankrate survey found that "of households with income below $50,000, about 44% say their savings has dropped, compared with 27% of those earning above that amount. . ." Bankrate reported that 27% of Americans say that they now have emergency savings that would last less than three months; 20% say their emergency savings would last from three to five months; and 25% say their emergency savings would last six months.[165]

Data specific to the State of Connecticut is consistent with these findings. The discussion below is based on the U.S. Census Bureau's "Household Pulse Survey." The Pulse Survey was designed to quickly and efficiently deploy data collected on how peoples' lives have been affected by the COVID-19 pandemic. According to the Census Bureau, data collection for the Household Pulse Survey began on April 23, 2020. The Census Bureau expected to collect data for 90 days, and to release data on a weekly basis. The Census Bureau began a "Phase II" of the Pulse Survey on September 9, 2020; it began a Phase III survey in mid-November. The data discussed below is from Week 23 of the Pulse Survey, for the week of January 20, 2021 through February 1, 2021.[166]

The problems posed by consumers being forced to use credit and/or savings to pay household bills during the pandemic can be seen from data specific to Connecticut. According to the Census Bureau's Pulse Survey (Week 23: January 20, 2021 – February 1, 2021), these households have substantially greater difficulties in meeting their household needs. While 16.4% of Connecticut residents using credit, and 19.5% drawing down savings, find it "very difficult" to pay "usual household expenses," only 6.2% using their pre-pandemic income sources do so. While 30.2% (money from savings or selling assets) to 29.0% (credit cards or loans) of Connecticut households find it "somewhat difficult" to pay their "usual household expenses," only roughly one-half that number (16.0%) using their normal pre-pandemic incomes sources do so. In total, nearly half of Connecticut residents who have been forced to use credit (29.0% + 16.4% = 45.4%), and almost exactly half forced to draw down savings or sell assets (30.2% + 19.5% = 49.7%), find it "somewhat" or "very" difficult to pay their usual household expenses during the pandemic.

[164] Covid-19 Economic Fallout, *supra* note 161, at 12.
[165] Survey: Nearly 3 times as many Americans say they have less emergency savings versus more since pandemic, available at https://www.bankrate.com/banking/savings/emergency-savings-survey-2020/.
[166] Available at https://www.census.gov/data/tables/2021/demo/hhp/hhp23.html.

In contrast, only 23.7% to 26.8% using credit or savings find it "not at all difficult" to pay their usual household expenses, compared to 56.0% of those who can use their normal pre-pandemic income sources.

Table 13. Difficulty paying for usual household expenses during the coronavirus pandemic (Connecticut) (January 20, 2021 – February 1, 2021)

HH Income	Not at all difficult	A little difficult	Somewhat difficult	Very difficult
Less than $25,000	17.1%	19.0%	28.5%	35.4%
$25,000 - $34,999	26.2%	23.4%	25.9%	24.5%
$35,000 - $49,999	24.5%	26.2%	36.6%	12.7%
$50,000 - $74,999	41.6%	20.2%	31.9%	6.4%
$75,000 - $99,999	51.8%	16.5%	21.1%	10.6%
$100,000 - $149,999	57.2%	24.7%	15.2%	2.8%
$150,000 - $199,999	67.5%	15.7%	12.7%	4.1%
$200,000 and above	87.7%	7.2%	4.6%	0.5%
Used in the last 7 days to meet spending needs[167]				
Regular income sources like those used before the pandemic	56.0%	21.5%	16.0%	6.2%
Credit cards or loans	26.8%	27.7%	29.0%	16.4%
Money from savings or selling assets	23.7%	26.5%	30.2%	19.5%
Borrowing from friends or family	3.8%	7.0%	25.0%	64.2%

The conclusion to be drawn from this data is that low-wage households are a long ways away from achieving any post-pandemic economic stability. Even should the public health crisis associated with COVID-19 end in the coming months, the associated economic crisis will continue. It is that economic crisis far more than the public health crisis that Connecticut utilities should address. It is the ongoing economic crisis that will adversely affect the ability-to-pay of Connecticut's utility customers.

[167] Totals may not sum to 100% as the question allowed multiple responses to be marked.

Part 6. Common Analytic Errors to Avoid

One fact about deliberations over a low-income bill affordability program, irrespective of the objective[s] established for such an initiative, is that there not only *may be* empirical disputes, but there are *likely to be* empirical disputes. As can be expected, because many of the benefits of such programs are perspective-dependent, basic differences exist in the possible approaches to resolving such empirical conflicts. Nonetheless, several sources of conflict can be avoided if recognized in advance.

A. TWO "MYTHS" WHICH IMPEDE ADOPTION OF LOW-INCOME AFFORDABILITY PROGRAMS.

In reviewing the empirical analysis of low-income energy assistance programs, several myths should be noted with respect to frequent critiques of low-income rates. These "myths," while they have been repeated for more than two decades, are worthy of repetition. With grateful acknowledgement to Professor Michael Hennessy,[168] his observations are presented somewhat condensed, but more or less intact.[169]

[168] Through the power of the Internet, even though these comments were authored over 25 years ago, Professor Hennessy was located and interviewed. These comments are presented herein with his permission.
[169] Hennessy. "The Evaluation of Lifeline Electricity Rates: Methods and Myths," 8 Evaluation Review 327 (1984).

i. The Myth of Complete Knowledge and Perfect Research

This first myth often translates into a discussion of not how much we know, but how much residual error there remains to be explained. More importantly, the myth of perfect knowledge is often used as an implicit criticism of a particular research effort rather than a measure of our general ignorance. The implication is often given that *other* researchers, *other* data bases, or *other* methodologies would have provided a more accurate, more complete, or more valid set of results. Of course, these alternative researchers, data or methods are never produced, so the actual research is always compared with some idealized concept of the possible – a sort of ideal type research design with no flaws. Given this theoretical comparison, obviously any particular research study can be found seriously defective.

* * *

Such techniques of research defamation have two negative consequences. First, they give the misleading impression that unflawed research is possible. McGrath has cogently argued that given the constraints of the research process and the inherently contradictory demands of "good research," it is impossible to maximize all positive features in any single research design. Hence, all research will be flawed. In fact, it is not possible to do an unflawed study. . .The power of the idealized study is contrasted nicely with the flawed (but empirical) method when McCloskey discusses theory testing. He says, "a conceivable but practically impossible test takes over the prestige of the real [but flawed] test, but free of its labor."

The apparent perfection of simulation studies is another case in point here. Of course, in these studies, there are no flaws at all since the studies are not sullied by authentic (but recalcitrant) empirical data. The appeal of simulations is exactly that they remain pristinely abstract and quite amenable to the will of the researcher. McCloskey, however, also points out that the difference between simulations being *amenable* to the will of the researcher and simply *being* the will of the researcher is often vanishingly small. (emphasis added).

However, the Myth of Complete Knowledge and Perfect Prediction is more than just an academic parlor game. If that were all, the myth would be merely amusing rather than pernicious. But if policy makers accept the premise of this myth, their reliance on the flawed, incomplete and partial knowledge provided by empirical research will ever decrease. And this will inevitably change the basis of rational

> decision making over to other even more incomplete, error-filled and partial methods like [special favors based on political connections], special pleading by interest groups, and bureaucratic rationales of system maintenance.

ii. The Myth of Maximum Benefit and Minimum Burden

The second "myth" identified by Professor Hennessy is that sufficiently detailed inquiry will result in the discovery of "a potential policy that benefits all and burdens none." He dismisses the search for such a policy as not only bound to fail, but also as being harmful in the meantime.

> The pervasiveness of this particular myth in the lifeline literature is quite amazing. The review of survey simulations. . .shows that in virtually every case lifeline rates are superior to the alternative rate structure, with greater percentages of targeted households benefiting and lesser proportions of non-targeted households burdened. Yet lifeline rates are routinely criticized (and rejected) for always producing some proportions of the targeted who are burdened and some proportions of the non-targeted who are benefited. As Berg states; "opportunities are missed when our lack of complete understanding causes unnecessary delays. The goal of perfect policies is one of the greatest enemies of the achievement of good policies."[170]

B. CONFUSING COST-BENEFIT AND COST-EFFECTIVENESS ANALYSIS.

In assessing the economic viability of a low-income bill affordability program, stakeholders frequently confuse the question of whether a program is "cost-beneficial" with the question of whether a program is "cost-effective." These two economic inquiries present distinctly different questions. The appropriate approach to use in assessing a bill affordability program is a cost-effectiveness analysis.

[170] Methods and Myths, *supra*, at 340. Contrast this discussion of "research myths" to the decision of the Minnesota Public Service Commission, which held in approving a Conservation Rate Break for customers consuming less than 300 kWh per month: "There is no question that lifeline is a blunt edged sword in attacking the utility problems faced by low-income users. The Commission readily admits that it will favor some persons who do not need the favor and provide only modest assistance to others who need much more. However, the Commission believes that these infirmities are far outweighed by the overall benefits to the large number of needy persons who are able to conserve energy usage. . .We are not required to choose between issuing an order which reduces all evils or issuing no order at all." Cleveland State University (1980). Lifeline Electric Rates and Alternative Approaches to the Problems of Low-Income Ratepayers: Ten Case Studies of Implemented Programs, at 253, National Technical Information Center: Washington D.C.

i. The Nature of "Cost-Effectiveness."

Cost-effectiveness analysis is used to evaluate options for achieving a set of defined objectives. A cost-effectiveness analysis is used to ensure the efficient use of resources in instances where benefits are difficult to monetarily value; when the information required is difficult to determine; or in any other cases where an attempt to make a precise monetary measurement of benefits would be tricky or open to considerable dispute.

While cost-effectiveness is related to cost-benefit analysis in that it is one of the four mechanisms for economic appraisal,[171] it differs from cost-benefit analysis in that cost-benefit analysis is used *only* to address those types of alternatives where the outcomes can be measured in monetary terms.[172]

The purpose of cost-effectiveness analysis is to assess whether an intervention provides value for money. Cost-effectiveness analysis is used to determine which of a set of alternative activities achieves the greatest outcome for the costs expended.[173]

ii. The Use of Cost-Effectiveness Analysis in Utility Regulation.

There are two sides to cost-effectiveness analysis. On the one hand, cost-effectiveness is used to identify the alternative that, for a given output level, minimizes the cost of achieving the output. On the other hand, cost-effectiveness is used to identify the alternative that, for a given cost, maximizes the level of output. From each perspective, the purpose of cost-effectiveness analysis is to ascertain which intervention (or program or measure, etc.) can achieve particular objectives at the lowest cost.[174]

[171] There are four types of economic appraisal: cost-minimization analysis; cost-utility analysis; cost-benefit analysis; and cost-effectiveness analysis.

[172] "Cost effectiveness analysis evaluates the costs of different means of achieving a pre-determined goal." Driesen (2005). Is Cost-Benefit Analysis Neutral, Syracuse University College of Law. A significant body of literature exists distinguishing a "cost-effectiveness" analysis from a cost-benefit analysis. *See generally*, Fuguitt and Wilcox. Cost-Benefit Analysis for Public Sector Decision Makers, Quorum Books: Westport (CT) (1999).

[173] *See e.g.*, Dobuzinskis, *et al.* (ed.). Policy Analysis in Canada: The State of the Art, Institute of Public Administration of Canada, University of Toronto Press: Toronto (2007).

[174] Wholey, *et al.* (eds.) Handbook of Practical Program Evaluation, 3d ed. (New York: John Wiley & Sons, 2010); Levin and McEwan (eds.), Cost-Effectiveness Analysis: Methods and Applications, 2d ed. (Thousand Oaks (CA): Sage Publications, 2001).

The two sides of the analysis are incorporated into what is termed the "cost-effectiveness plane." This cost-effectiveness plane consists of a two-dimensional assessment as follows:

Less effective / more expensive	More effective / more expensive
Less effective / less expensive	More effective / less expensive

Both components of the analysis –the extent to which the objectives are achieved (*i.e.*, more/less effective), on the one hand, and the cost of achieving those objectives on the other hand (*i.e.*, more/less expensive)—are considered. The underlying assumption is that different alternative actions are associated with different costs as well as different results. By choosing those options with the least cost ***for a given outcome***, society can use its resources most effectively.[175]

All of these observations relate to utility regulation. As explained in more detail above, the objectives of utility regulation include the following:

- One objective of utility regulation is to provide least-cost service, the precise objective which cost-effectiveness is designed to measure.

- One objective of utility regulation is to achieve the efficient delivery of utility service, the precise objective which cost-effectiveness is designed to measure.

- One objective of utility regulation is to operate in the most cost-efficient manner to accomplish the desired objectives, the precise objective which cost-effectiveness is designed to measure.

Spending less money to fall short of generating the desired outcome has never been a utility regulatory objective.[176] Cost-effectiveness is explicitly designed to measure costs taking into account the extent to which desired outcomes are achieved.

[175] Cost-effectiveness analysis has always entailed a very practical application. Cost-effectiveness analysis was developed in the 1950s by the United States Department of Defense for assessing the demands of the various branches of the armed services for increasingly costly weapons systems with different levels of performance and overlapping missions. By the 1960s, it had become widely used for analyzing the efficiency of alternative programs outside of the military. Hitch and McKean, Economic Choice in Military Planning, at 217, in Managerial Economics and Operations Research: A Non-Mathematical Introduction, Mansfield, ed. (New York: W.W. Norton, 1966).

[176] Consider the farmer who is assessing the "business case" for how to keep the grass in his back pasture short. He identifies three alternatives: (1) a push mower (with a low capital investment but high labor costs); (2) a power mower (with a high capital investment but low labor costs); and (3) a herd of sheep. The first question the farmer asks is not "what is the cost?" The first question must be: is the grass being kept short?

iii. The Notion of Dollars of Savings Exceeding Dollars of Costs.

A cost-effectiveness analysis does not seek to determine whether the dollars of savings generated by a program exceed the dollars of cost for that program. That analysis is a cost-benefit analysis, an analysis that is inappropriate to an evaluation of low-income bill affordability initiatives. *To apply a cost-benefit analysis to a low-income bill affordability program is to make an inappropriate choice of economic appraisal mechanisms.*

- First, a cost-benefit analysis does not specify the public policy decision that has been made that utility service should be preserved where feasible.

- Second, a cost-benefit analysis would need to identify the entire range of benefits over time, a task that would be difficult, if not impossible, to do. For example, the reduced financing costs arising from the increased stability in revenue would be difficult to determine.

- Third, a cost-benefit analysis assumes that all financial and economic benefits can be identified, dollarized and measured. That assumption would be wrong. For example, it is difficult, if not impossible, to dollarize (and then to measure) the benefit to the utility of increased sales to customers whose service has not been disconnected for nonpayment.

  It is also difficult, if not impossible, to dollarize (and measure) the benefit to the utility of re-directing collection efforts away from customers who *cannot* afford to pay so that the utility can instead redeploy those collection activities toward customers who *can* afford to pay.

- Fourth, preparing a cost-benefit analysis would require the utility to identify the *incremental* costs of the bill affordability program. The incremental costs are limited to the costs that would not be incurred in the absence of the program. It is not at all clear that that dollar amount is a positive number.

These are merely illustrations of why it is inappropriate to apply a cost-benefit test in an analysis of bill affordability initiatives.

iv An Additional Illustration of Where Cost-Benefit Analysis is Inappropriate for a Public Utility.

The notion that cost-benefit analysis may be inappropriate is not unique to a low-income bill affordability program. Another example of a practice which a public utility would not subject to a cost-benefit analysis would be worker safety. Reasonable utility management would not accept worker injury or death based on an economic analysis concluding that preventing the injury or death would cost the utility more than the benefits returned to the utility by protecting the worker.

Instead, as with an affordability program, the proper test to employ would be cost-effectiveness. Such an analysis would assess how to minimize the cost per unit of output (worker safety) and/or how to maximize the output per dollar of input.

Cost-effectiveness analysis is not only an "accepted" technique in public policymaking, it is frequently the ***preferred*** technique for circumstances such as those presented by low-income inability-to-pay. For example, as the Treasury Board of Canada stated in its "Canadian Cost-Benefit Analysis Guide: Regulatory Proposals" in 2007:

> When benefits cannot be expressed in monetary values in a meaningful way, ***a cost-effectiveness analysis ("CEA") should be carried out*** to assist in making effective decisions. A CEA calculates cost-effectiveness ratios so that the most efficient option is chosen. In a sense, a CEA ensures technical efficiency in the process of achieving a desired outcome.

(emphasis added).

Part 7. A Recommended Utility Bill Affordability Program.

Based on the data and discussion presented above, this section outlines the essential components comprising an effective and efficient Bill Affordability Program for Connecticut utilities. These components include:

- A rate affordability component;
- An arrearage management component;
- A crisis intervention component; and
- A usage reduction component.

Each individual program component is described in more detail below.

A. BILL AFFORDABILITY DISCOUNT

The first critical component of a Bill Affordability Program is a bill affordability discount. Through the bill affordability discount component, the price of home energy[177] is set at a level that will generate the greatest ability of low-income customers to make actual payments.

[177] This includes either electricity or natural gas or both.

Building a bill affordability discount consists of the following basic steps:

1. **Eligibility:** Defining the eligibility for the bill affordability discount should allow the program to be *open to enrollment* by any low-income consumer.[178] For purposes of this program, a "low-income consumer" is any consumer with gross household income at or below 150% of Federal Poverty Level.[179]

2. **Outreach:** Informing low-income customers of the availability of the bill affordability discount involves both education about the *existence* of the program and education about *how to enroll* in the program. The most effective forms of outreach for utility universal service programs have been found to involve the use of community-based organizations as well as organizations that deliver benefits to the same households that are eligible to receive utility benefits.

3. **Benefits:** Distributing bill affordability discounts should be on a fixed credit basis. The fixed credit benefits are delivered to the program participant as part of a levelized monthly billing plan. The levelized bill under the rate assistance program will represent the annual bill, minus the annual fixed credit, divided into twelve[180] equal monthly installments.

4. **Collections:** Enforcing customer payment obligations after a customer receives a bill affordability discount should occur through the same credit and collection activities directed toward any residential customer. If a customer receiving a bill affordability discount does not make appropriate payments, that customer enters the collection cycle with the same rights and responsibilities as any other customer. In this fashion, no new or special administrative process is created for the discount recipients.

5. **Recertification:** Recertifying income for customers whose income cannot reasonably be determined to be non-variable over the long-term should occur on an annual basis.

[178] Defining eligibility and targeting outreach are two distinctly different tasks. The utility may define eligibility so that all low-income customers may participate, but nonetheless seek to target *outreach* to specific payment-troubled customers. Targeting places special emphasis on enrolling a particular class of customers from among those classes that are eligible.

[179] A rate affordability program that distributes assistance based on energy burdens is not geared to serve customers living with even moderate incomes. As a general rule, customers with even moderate incomes will have energy bills that do not exceed the affordable burden that serves as the basis for universal service benefits. Assume, for example, a household living with an income of $30,000. If the affordable electric burden were 6% of income, that household would need to experience an electric bill of $1,800 or more to benefit from the universal service program. Accordingly, extending the eligibility to these higher income households offers a false sense of program expansion. Few, if any, of these higher income households benefit from a burden-based universal service program.

[180] If a utility offers only an eleven month levelized billing plan, there is no problem. There is no "magic" to a 12-month levelized budget-billing plan.

> For those customers whose income cannot be recertified through a public agency, the customer will be notified at an appropriate time before his or her anniversary date of the need for recertification.

Having provided this summary, the remainder of this section will address the structural issues of a bill affordability discount in more detail.

Bill affordability discounts should be tied to the most recently available Federal Poverty Level published by the U.S. Department of Health and Human Services. It should be recognized, however, that under a bill affordability discount that is based on affordable home energy burdens, if, because of relatively higher income or relatively lower home energy bills, the pre-determined percent of a household's income will exceed their annual electric bill, the household will receive no benefit. In those instances, the home energy bill is deemed "affordable" and the local utility will collect the entire bill at standard residential rates. Only in those instances where the household faces a utility bill that exceeds the designated percentage of its income, is the bill deemed to be "unaffordable" and the bill affordability discount is offered to reduce the burden to an affordable level.[181]

Rate affordability assistance in Connecticut should be distributed on a percentage of income basis. Using a percentage of income approach to targeting provides a more efficient use of scarce rate affordability resources. This can be demonstrated by comparing an across-the-board discount to a percentage of income approach. While a percentage of income approach delivers those benefits, but only those benefits, needed to bring low-income bills into an affordable range, an across-the-board discount does not. Using an across-the-board discount, the bill affordability discount would pay some customers *more* than is necessary to bring bills into an affordable range while paying other customers *less* than is necessary to bring bills into an affordable range. Accordingly, it is most appropriate to base the bill affordability discount component of the Bill Affordability Program on a percentage of income targeting mechanism.

An affordable burden of 6% is recommended for total home energy. The 6% burden has been frequently adopted,[182] including in the states of New Hampshire,[183] New York,[184] New Jersey[185]

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[181] To illustrate, assume a household has an annual income of $25,000, an annual energy bill of $1,200, and is asked to pay six percent (6%) of her income toward her energy bill in an income-based program. This customer's income-based energy bill payment would be $1,500 ($25,000 x .06 = $1,500). Hence, this customer would decide *not* to participate in the income-based rate, since her fully-embedded bill is *less* than the bill rendered under the Bill Affordability Program.

[182] Six percent is based on the recognition that total shelter costs are generally deemed to be unaffordable to the extent that they exceed 30% of income. Moreover, utility costs tend to equal 20% of total shelter costs. A multiplication of those two data points (20% times 30%) yields the 6% figure.
It is universally accepted that total shelter costs are "unaffordable" if they exceed 30% of income. Total shelter costs include not only rent/mortgage, but all utilities (except telephone). See generally, Schwartz and Wilson

(2008). "Who Can Afford to Live in a Home: A Look at Data from the 2006 American Community Survey," U.S. Census Bureau: Washington D.C. They state in relevant part:

> The conventional public policy indicator of housing affordability in the United States is the percent of income spent on housing. Housing expenditures that exceed 30 percent of household income have historically been viewed as an indicator of a housing affordability problem. The conventional 30 percent of household income that a household can devote to housing costs before the household is said to be "burdened" evolved from the United States National Housing Act of 1937.
>
> * * *
>
> Because the 30 percent rule was deemed a rule of thumb for the amount of income that a family could spend and still have enough left over for other nondiscretionary spending, it made its way to owner-occupied housing too. Prior to the mid-1990s the federal housing enterprises (Fannie Mae and Freddie Mac) would not purchase mortgages unless the principal, interest, tax, and insurance payment (PITI) did not exceed 28 percent of the borrower's income for a conventional loan and 29 percent for an FHA insured loan. Because lenders were unwilling to hold mortgages in their portfolios, this simple lender ratio of PITI to income was one of many "hurdles" a prospective borrower needed to overcome to qualify for a mortgage. There are other qualifying ratios as well; most of which hover around 30 percent of income. The amount of debt outstanding and the size and frequency of payments on consumer installment loans and credit cards influence the lender's subjective estimation of prospective homebuyers' ability to meet the ongoing expenses of homeownership. Through the mid-1990s, under Fannie Mae guidelines for a conventional loan, total allowable consumer debt could not exceed eight percent of borrower's income for conventional mortgage loans and 12 percent for FHA-insured mortgages. So through the mid-1990s, underwriting standards reflected the lender's perception of loan risk. That is, a household could afford to spend nearly 30 percent of income for servicing housing debt and another 12 percent to service consumer debt. Above these thresholds, a household could not afford the home and the lender could not afford the risk. While there are many underwriting standards, none of them made their ways into the public policy lexicon like the 30 percent of income indicator of housing affordability.
>
> The mid to late 1990s ushered in many less stringent guidelines. Many households whose housing costs exceed 30 percent of their incomes are choosing then to devote larger shares of their incomes to larger, more amenity-laden homes. These households often still have enough income left over to meet their non-housing expenses. For them, the 30 percent ratio is not an indicator of a true housing affordability problem but rather a lifestyle choice. But for those households at the bottom rungs of the income ladder, the use of housing costs in excess of 30 percent of their limited incomes as an indicator of a housing affordability problem is as relevant today as it was four decades ago.

[183] New Hampshire Public Utilities Commission, Docket No. DE 06-079 (2006). ("The current tiered Low Income Electric Assistance Program (EAP) was designed with the goal of making electricity "affordable" at 4 % of household gross income for power and light usage and 6% of household gross income for electric heat.")

[184] The New York Public Service Commission favored a 6% energy burden level because it appears to be a widely accepted limit for utility payments, including in New Jersey and Ohio; and also reflected by EIA data. New York Public Service Commission's *Order Adopting Low Income Program Modifications and Directing Utility Filings* at 7-48, Case 14-M-0565 (effective May 20, 2016).

[185] New Jersey requires USF customers who use natural gas for heating and electricity will pay 3% for their natural gas service and 3% for their electricity service. If, however, the customer uses electricity for heating, the entire 6%

and Illinois.[186] In addition, at its public meeting on September 19, 2019, the Pennsylvania PUC voted to cap home energy burdens for households with annual income at or below 50% of Poverty Level at 6% of income.[187] This affordable burden is allocated between electric and natural gas service on a 50%/50% basis.[188] The affordable burden for electric bills standing alone, therefore, is 3% of annual income.

Although a variety of percentage-of-income based approaches exist, delivery of bill affordability discounts using a fixed credit approach is most appropriate. The fixed credit approach begins as an income-based approach. In order to be eligible for the discount, a household must meet *both* eligibility criteria: (1) that the household income is at or below the prescribed Federal Poverty Level; and (2) that the household energy burden exceeds the burden deemed to be affordable.[189]

The fixed credit approach next calculates what bill credit would need to be provided to the household in order to reduce the household's energy burden to the designated percent of income. To calculate the fixed credit involves three steps: (1) calculating a burden-based payment; (2) calculating an annual bill; and (3) calculating the fixed credit necessary to reduce the annual bill to the burden-based payment. Each step is explained below.

1. **Burden-based payment:** The first step in the fixed credit model is to calculate a burden-based payment. Assume --simply for the sake of illustration here-- that the household has an annual income of $8,000 and is required to pay six percent (6%) for its home energy bill. The required household payment is thus $480. This is determined as follows: $8,000 x 6% = $480.

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is devoted to the electricity service. The discount provided to customers is based on the difference between their annual utility bill (after LIHEAP is applied) and the required percentage of household income. https://www.state.nj.us/dca/divisions/dhcr/faq/usf.html#q1

[186] Illinois administers a percentage of income plan (PIP) that charges customers a maximum of 6% of their income for gas and electric service. The maximum PIP credit, however, is $150 per month or $1,800 annually. Illinois Senate Bill 1918 at 108-109. http://www.ilga.gov/legislation/96/SB/PDF/09600SB1918lv.pdf

[187] Pennsylvania PUC (September 19, 2019). Home Energy Affordability for Low-Income Customers in Pennsylvania, Final Policy Statement and Order, Docket M—2019-3012599.

[188] Allocating the burden on a 50%/50% basis between electricity and natural gas service is unquestionably a conservative approach given that electric bills tend to be higher than natural gas bills. Nonetheless, three principles are in play in this recommendation. First, "affordability" is a range and not a point. It cannot be said, for example, that 3% is affordable but 3.5% is not. Second, given that some utilities are a combination gas/electric utility, the allocation of burdens between gas and electric service for the customers of such utilities will involve no distinction. Third, an analysis should not imply greater precision than can actually be achieved in reality. From a practical perspective, a gas/electric split for a 6% burden can either be 3%/3% (50%/50%) or can be 4%/2% (67%/33%). While the 3%/3% split may somewhat understate electric affordability, a 4%/2% split would somewhat overstate electric costs. Accordingly, use an intuitively explainable allocation of 50%50% (3%/3%) is recommended.

[189] A customer may still participate in the arrearage management program component even if he or she does not participate in the rate affordability component.

Distinctions in the percentage of income payment are made based upon whether the customer is a heating or non-heating customer. The payment is split evenly between the heating and non-heating component of the utility bill. Under a 6% scenario, a natural gas heating customer would be asked to pay three percent (3%) of the household's income toward her home heating bill, and another three percent (3%) toward her electric bill. An all-electric customer would pay six percent (6%) toward her electric bill. Other percentage burdens would be similarly split half-and-half (8% converts to 4% toward each fuel).

The energy burden represented by a combined heating and non-heating energy bill should not generally exceed six percent (6%) of income. It is generally accepted that a household's "shelter burden" (rent/mortgage plus taxes plus utilities) should not exceed 30% of income. In addition, a household's home utility bill should not exceed 20% of the household's shelter costs. Combining those two yields an affordable home energy burden of six percent (6%).[190] Clearly, however, the reasonableness of an energy burden is a range and not a point. Ultimately, whether an affordable burden should be set as 6% or as 8% (or some other figure) is a policy decision. The percentage of income burden that triggers significant payment-troubles (*e.g.*, service disconnections) appears to be in the range of 10% to 12% of annual income.[191]

2. **Projected annual bill:** The second step is to calculate a projected annual household energy bill. This calculation is to be made using whatever method the local utility *currently* uses to estimate annual bills for other purposes. A utility, for example, will likely have an established procedure for estimating an annual bill for purposes of placing residential customers (low-income or not) on a levelized Budget Billing Plan (where bills are paid in equal installments over 12 months). That same process can be used to estimate an annual bill for purposes of calculating the needed fixed credit.

3. **Fixed credit determination:** The final step is to calculate the necessary fixed credit to bring the annual bill down to the burden-based payment. Given an annual bill projection of $1,200 and a burden-based payment of $480, the annual fixed credit would need to be $720 ($1,200 - $480 = $720). The household's *monthly* fixed credit would be $60 ($720 / 12 = $60).

In addition to various administrative benefits from use of a fixed credit, the fixed credit offers the advantage of providing a strong conservation incentive to the low-income customer. Under the

[190] This report sets aside for the moment the inclusion of water and sewer utility bills in this six percent.
[191] "Affordability" concerns are triggered at much lower percentage of income burdens. Affordability concerns, involving household budget trade-offs and payment troubles less intense than the loss of service appear to be triggered at the 6% to 8% percentage of income burden levels.

fixed credit model, the local utility provides a $60 fixed credit to the low-income household irrespective of the household's actual bill. If the household increases its consumption, and thus has a higher bill, the household pays the amount of the increase. If, in contrast, the household conserves energy and thus lowers its bill, the household pockets the savings.

The administrative advantages of the fixed credit program are two-fold. First, use of fixed credits as a benefit distribution mechanism allows the program to work within a fixed operating budget. Once a low-income customer is enrolled in the universal service program, the maximum possible financial exposure for the time of the enrollment is established. At no time, can the maximum financial exposure exceed the budgeted program revenues. Systems can be easily designed to track funds that are obligated and expended to ensure that the budget is not exceeded. In contrast, benefit expenditures through either a straight percentage of income program or a percentage of bill program may vary based upon changes in consumption.

In addition to this budgeting advantage, the fixed credit approach makes the billing less complicated as well. Using the same process that currently exists to establish a levelized Budget-Billing plan, fixed credits can be subtracted from a customer's levelized annual bill. The monthly bill is then rendered based upon this one-time annual adjustment. The utility does not need to make monthly billing adjustments as is the case with either the straight percentage of income, or with the percentage of bill, approach.

If, because of budget constraints, it does not appear that an entirely "pure" affordability program can be implemented, modest changes can be made to the affordable burden. One reasonable response to a strict budget constraint would be to modestly increase the percentage burden that a customer is required to pay. Setting the "affordable" burdens at 4% and 8% (rather than 3% and 6%), for example, could well bring the program within the budget.

In sum, the following critical components of the proposed rate affordability component of a bill affordability discount are proposed above:

- Eligibility is set at 150% of the annual Poverty Level;
- Enrollment should be, to the maximum extent feasible, implemented through an automated data exchange with social assistance agencies;
- Rate affordability discounts should be delivered through a fixed credit approach;

- The level of "affordability" should be set at 6% of household income. This affordability factor should be split evenly between baseload electric usage (3%) and space heating (3%). An all-electric household should pay the full 6%.[192]

B. AN ARREARAGE FORGIVENESS COMPONENT

An arrearage management program component is critical to achieving the bill payment objective of a Bill Affordability Program. An arrearage management program component is designed to reduce pre-program arrears to a manageable level over an extended period of time. Through an arrearage management program, a customer earns credits toward his or her preprogram arrears over a period of time, so long as the customer remains on the Bill Affordability Program. By the end of the time period, the household's preprogram arrears will be reduced to $0.

An arrearage management program component is necessary to help get low-income customers "even" so they have a chance at future success in making payments. It makes no difference to have ***current*** bills be affordable if the household is subject to service termination for ***past due*** bills incurred before the program began (known as preprogram arrears). In addition, it makes no sense to have current bills be affordable if the total bill is unaffordable due to payment obligations required to retire past arrears.

While some utilities simply forgive all arrears brought into a Bill Affordability Program at the time the program begins, most utilities provide arrearage management over an extended period of time. In the latter situations, the time period over which to provide preprogram arrears credits needs to stay within the reasonable planning horizon of the customer.[193] The program design in this report incorporates an arrearage management period of two years. Arrearage credits are earned on a monthly basis.[194]

No prerequisite is proposed for the offer of arrearage management credits. While at first blush, it may seem desirable to make the grant of credits toward preprogram arrears contingent upon full and timely payment of current bills,[195] there are both policy and operational reasons not to do this.

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[192] As discussed in more detail above, however, the affordable burden is a range and not a point.

[193] To suggest, for example, that arrears will be reduced to $0 over a period of four or more years is outside the horizon within which low-income households do their planning.

[194] While arrearage credits are to be ***earned*** on a monthly basis, they can be ***credited*** to the account (or "posted" to the account) on a quarterly or semi-annual basis. The point at which earned preprogram arrears credits are actually credited is often a matter of billing system programming rather than a program policy question.

[195] When universal service programs were first designed, there was a tendency to think of credits toward preprogram arrearages as an "incentive" for low-income customers to make their current bill payments on a full and timely basis. That belief has been since largely abandoned.

- First, there are the operational issues. To implement such a contingent credit, the local utility would need to develop an information system process that determines, on a monthly basis, not only whether the full bill has been paid, but whether it has been paid on a timely basis. Depending on the answer to those inquiries, different bills will be generated by the utility (either one reflecting an arrears credit or one not reflecting such a credit). Layering a process for "curing" missed payments adds further administrative complexity.

- Second, from a policy perspective, program administrators have learned that the best "incentive" for making full and timely payments is to have customers taking service pursuant to the Bill Affordability Program be subject to the same credit and collection processes as all other customers. In addition, creating layer upon layer of "incentives" for payments clouds the fundamental underlying proposition. That proposition posits that, in recognition of the underlying unaffordable burden posed by utility bills at fully-embedded rates, the low-income customer is allowed to take service under the Bill Affordability Program. Given that utility response to unaffordability, customers then have the responsibility to make full and timely payment of their bills irrespective of any further "incentive."

Accordingly, nonpayment for service provided under the Bill Affordability Program will be met by placing the customer into the same collection process as that which would be faced by any other customer. Nonpayment does not result in mere suspension from the program. Nor does it result in mere loss of arrearage management credits. Nonpayment under the Bill Affordability Program will place the program participant in the collection process.

This proposal recommends that Bill Affordability Program participants should make a monthly payment toward preprogram arrears. In this fashion, customers with minimum levels of payment troubles will not receive credits toward their arrears. In addition, in this fashion, universal service customers will bear some responsibility for their preprogram debt.[196]

The requirement of a customer copayment toward a preprogram arrears, however, should not interfere with the underlying affordability goals of the Bill Affordability Program. Accordingly, rather than setting a customer copayment at some arbitrary dollar level, this proposal recommends setting the customer copayment level equal to a percentage of income. In this fashion, the payments toward preprogram arrears are explicitly tied to affordability considerations.

[196] However, some utilities have decided that the cost of developing a billing capacity for the customer copayment is not merited by the amount of revenue produced by the copayment process. These utilities provide credits toward 100% of the preprogram arrears.

The proposed preprogram arrears customer copayment for this program is set equal to one percent (1%) of household income. The operation of such an approach, given assumed different levels of preprogram arrears is demonstrated in the table below. A household with an income of $10,000 would make a 1% copayment over a two-year period ($10,000 x 0.01 = $100/year x 2 years = $200). Accordingly, if that customer had a pre-program arrears of $600, the customer would receive an arrearage management credit of $400 ($600 arrears - $200 copayment). A customer with an income of $25,000 would make a copayment of $500 over a two-year period. Accordingly, if that customer had a pre-program arrears of *less than* $500, he or she would receive no arrearage management credit. If that customer had a pre-program arrears of $600, the customer would receive an arrearage management credit of $100 ($600 arrears - $500 copayment).

Table 14. Operation of a Burden-Based Arrearage Management Customer Copayment

Income	Copayment			Arrearage Management Credits by Level of Pre-Program Arrears /b/			
	Years of Copayment	Income Pct	Dollar Amt /a/	$150	$300	$600	$1,200
$5,000	2	1%	$100	$50	$200	$500	$1,100
$10,000	2	1%	$200	$0	$100	$400	$1,000
$15,000	2	1%	$300	$0	$0	$300	$900
$20,000	2	1%	$400	$0	$0	$200	$800
$25,000	2	1%	$500	$0	$0	$100	$700
$30,000	2	1%	$600	$0	$0	$0	$600

NOTES:

/a/ Years of payment x {income x income percent].
/b Level of preprogram arrears minus dollar amount of copayment.

In sum, the following critical components of the proposed arrearage management component of a Bill Affordability Program are proposed above:

- Arrears are to be retired over a two-year period;
- Customers are to make copayments toward their arrears;
- Copayments are to be set equal to an affordable percentage of income (1% per year);
- No pre-condition is established for the grant of arrearage management credits; and
- The appropriate response to nonpayment is to place the program participant in the same collection process as any other residential customer.

C. A CRISIS INTERVENTION COMPONENT.

The need for a crisis intervention component to a Bill Affordability Program arises from three different attributes of low-income households.

- First, one attribute of low-income households is their lack of cash assets to allow them to weather the storm of unexpected expenses or unexpected loss of income. Low-income households do not have the ability to withstand, for example, a significant expense associated with a family emergency, or the loss of income associated with such an emergency. Given such exigencies, there is a likelihood that some proportion of customers taking service under the Bill Affordability Program will have occasional exigencies that can be met through a crisis intervention program.

- Second, one attribute of a low-income household is that low wage workers tend to be hourly wage workers. The overwhelming majority of these workers lack paid leave. The need for either medical leave, or family care leave, in other words, leads directly to lost income when paid leave is not provided. The lack of paid leave time may directly affect the ability of a working poor customer to maintain payments on their monthly utility bill. A person working 35 hours a week on hourly wages may lose three days of work simply due to a sick child missing school and requiring care. If no paid leave time exists for that employee, the sick child translates into permanently lost wages.

- Third, low wage workers tend to have lower quality jobs, often marked by considerable income fluctuations due to the number of hours they are called upon to work. The number of lost hours, and thus the amount of lost wages, is referred to as "involuntary part-time employment." This fact of unstable income presents no commentary on the working poor individuals themselves. Rather it reflects the nature of work in which the working poor find themselves.

Given these attributes of the target population, the crisis component of the Bill Affordability Program provides a budget to provide crisis intervention assistance on an as-needed basis.

Crisis intervention assistance should not be based on income eligibility such as that established for the Bate Affordability Program. Crisis intervention is as frequently triggered by unusual expenses as by persistently low-income. A senior citizen facing medical expenses, as well as a working poor household facing substantial automobile repair expenses, may be marginally capable of paying their monthly bills but for their unusual expenses. The agency or community-based organization administering crisis interventions should be provided the flexibility to

distribute crisis intervention funding on an as-needed basis rather than be bound by income limitations.

Given this, assistance provided through the crisis intervention component should be on a limited-time basis. The crisis intervention is intended to help meet financial exigencies rather than to provide monthly rate affordability assistance to customers.

In sum, the following critical components of the crisis intervention component of a bill affordability program are proposed above:

- The crisis intervention component should not be based on income-eligibility;
- The crisis intervention component should provide administering agencies with the flexibility to distribute assistance on an as-needed emergency basis;
- The crisis intervention component should be on a limited-time basis; and

D. ENERGY EFFICIENCY INVESTMENTS.

The fourth critical component to a Bill Affordability Program involves the delivery of energy efficiency services. Successful implementation of a usage reduction program relies on the creation of an ongoing partnership between local community-based organizations (CBOs) and the local utility. The local utility should combine efforts with local CBOs so as to maximize utility investment in cost-effective energy savings measures and maximize total investment in the non-energy savings measures that depress utility benefits.

One of the most difficult aspects of the design of a low-income usage reduction program is to establish an appropriate low-income usage reduction budget. Conceptually, "adequate" funding of the low-income usage reduction program means that the utility's low-income usage reduction budget should increase until the company exhausts its cost-effective measures. While, in theory, the utility should continue to fund its usage reduction programs until the program's marginal costs equal the marginal benefits, in reality, no such "full" funding is ever provided. In light of this, there may seem to be no principled basis upon which to set a low-income budget. Nonetheless, *one* principle does seem appropriate for regulators to adopt. The extent of low-income usage reduction funding should be sufficient to ensure that there are no lost opportunities in any given year.

Lost opportunities arise when the accomplishment of some given task precludes the future accomplishment of additional work at that same dwelling. Some frequent lost opportunities involved with similar utility programs include:

- **Low-income housing developments:** Decisions made by low-income housing developers represent decisions that will hold for the useful life of the measures. Accordingly, if a developer installs a relatively inefficient furnace or hot water heater, or fails to install the most cost-effective level of insulation, it is not likely that a utility will soon revisit that home to install more energy efficient measures. The opportunity to install high efficiency measures is lost at the time of the developer's initial decision.

- **Unused institutional capacity:** Assume the institutional capacity of low-income service providers is 8,000 homes per year in a given utility service territory. These service providers might include local contractors, CBOs involved with delivering usage reduction services,, and other for-profit or non-profit institutions. If the combined budget of low-income programs funds only 6,000 homes a year, there is a lost opportunity to increase the usage reduction by 2,000 homes. By assumption, the maximum capacity is 8,000 homes per year. That capacity thus cannot be pushed to 10,000 for a year to "make up" the earlier lost opportunity.

Clearly, the two parts of this analysis would need to be combined. There will be unused capacity both in the number of units done per year and in the investment per unit.

As can be seen, one component of a utility low-income usage reduction program is a periodic inventory of the institutional capacity to deliver low-income usage reduction measures. The inventory should cover the planning period of the utility. If the utility files three-year usage reduction plans with regulators, in other words, its inventory should include the existing and projected capacity to deliver low-income services over that three-year period. The budget for low-income usage reduction should be sufficient to finance full utilization of the inventoried capacity.

In sum, the proposed decision rule is that utility funding should be of sufficient magnitude to ensure that there is no unused institutional capacity to deliver cost-effective low-income usage reduction service. The local utility's low-income usage reduction budget should increase until the company exhausts its cost-effective measures, or until it exhausts the institutional capacity to deliver cost-effective measures, whichever comes first.

In addition to setting a budget for the usage reduction program component, this proposal sets a mission as well. The usage reduction program directed toward low-income customers should be explicitly targeted to help advance the resolution of payment troubles and improve the affordability of home energy in addition to simply reducing home energy usage.

Maximizing benefits to all utility customers, whether through reduced traditional energy and capacity costs or through the reduction of costs associated with low-income payment troubles, is dependent upon an appropriate targeting of the low-income program. Two primary alternative decision rules exist to guide targeting a low-income efficiency program:

- To target those with the highest energy usage, believing that these households present the greatest potential for energy savings; or

- To target those with the greatest payment problems, believing: (a) that payment problems and high usage are positively associated; and (b) that these households present the greatest potential for improved energy affordability.

To a certain extent, the difference between the two principles is artificial if one accepts the premise that usage reduction can generate not only traditional avoided costs, but can also generate avoided costs associated with a reduction in payment troubles as well. It has become well-established over the years that payment-troubles are often associated with higher than average utility consumption. By targeting customers with payment troubles, in other words, a utility implicitly targets its higher use customers as well.

In addition, the delivery of usage reduction services will decrease the costs of the bill affordability discounts discussed above. This impact is perhaps best explained by illustration. The issue of a utility's obligation to integrate its offer of usage reduction measures with its deferred payment plans for low income households, for example, was raised in a 1991 rate case involving Central Maine Power company (CMP) before the Maine Public Utilities Commission (PUC). In that proceeding, the staff of the PUC submitted testimony concerning CMP's marketing of "energy management services" to low-income customers.

According to information presented in that proceeding, there is a positive correlation between high arrears balances and high usage. The company, according to the PUC staff, "should pursue the implications of the [recent study of payments plans] and undertake a marketing effort that targets high use, low-income customers." The company, according to the staff testimony, was not effective in its marketing.

The state Office of Public Advocate agreed. According to that office, CMP could significantly reduce its write-offs and collection costs by providing energy management services to high usage customers on special payment arrangements. The Public Advocate said that the utility could have saved as much as $2 million a year "if CMP ha(d) been successful in delivering its Insulation Plus and Bundle Up programs to its special payment arrangement customers."

The Maine PUC acted favorably on the criticisms of the lack of action by Central Maine Power. According to the Commission:

> The successful marketing of energy management programs to low-income customers, particularly low-income customers on special payment arrangements, has a clear benefit above and beyond the capacity or energy savings generally associated with demand-side management programs. Low income customers that see a reduction in their bills will be able to manage their bills better. The Company's carrying costs associated with late-paid bills and uncollectibles, which are generally passed on to other ratepayers, should be reduced.

The PUC directed the company to take remedial action.

In sum, aside from the issue of appropriately targeting its low-income usage reduction program, one final question to be pursued in designing utility-funded low-income usage reduction is whether the utility has adequately integrated its low-income usage reduction program into all aspects of the company's operation. As illustrated by Maine's special payment arrangements, it is possible for a utility to use low-income usage reduction investments to improve the efficiency and effectiveness of other activities directed toward low-income payment-troubled customers.

In sum, the following critical components of the usage reduction program component of a Bill Affordability Program are proposed above:

- Low-income usage reduction should be funded at a level that will prevent lost opportunities;

- Efficiency investments should be targeted not only on the basis of high usage, but on the existence of payment troubles as well;

- The utility's outreach for the usage reduction programs should be tied into other aspects of its customer service operations, including the management of arrears; and

- The low-income usage reduction investments should be delivered in collaboration and in partnership with existing usage reduction investments and affordable housing programs.

E. SUMMARY AND CONCLUSIONS.

A Bill Affordability Program should consist of the following four distinct elements:

- A bill affordability discount;

- An arrearage management program;
- A crisis intervention element; and
- A usage reduction component.

Each of these elements, while discussed in detail above, will be summarized below.

Bill affordability discount: The bill affordability discount is directed towards bills for current service. Considerable research shows that when bills for current service exceed an affordable percentage of income for low-income customers, payment patterns significantly deteriorate. Capping bills at an affordable percentage of income results in low-income customers paying bills more completely, more regularly, more timely, and with less need for collection activity to be directed toward them. In addition, utilities delivering bills at an affordable percentage of income experience a higher productivity and efficiency in their collection activities. Not only do they have fewer collection activities, they use less intense collection activity as well.

A percentage of income approach to delivering discounts is directly tied to the notion of providing a discount to the extent, but only to the extent, needed to achieve affordability. A low-income customer does not receive a discount simply because they are low-income. If a low-income customer, due to relatively higher incomes or relatively lower bills, can achieve an affordable bill with a lesser discount, they receive only that lesser discount. The objective is to reduce the bill to the point where it is sustainably payable by the low-income customer, not to provide a discount to someone simply because they are poor.

In this respect, a percentage of income program is better targeted, and thus more efficient, than a flat discount. A flat discount of 30%, for example (and hypothetically), gives the same discount to a customer with an annual income of $20,000 and a $500 bill that it gives to a customer with an annual income of $8,000 and a $900 bill. A percentage of income program does not. Instead, the percentage of income discount bases the discount on need. A customer receives what they need, but no more than they need. In this fashion, a percentage of income program is efficient. A discount that provides more than is required is inefficient because the "excess" discount has no impact on improving bill payment patterns. Conversely, a discount that provides less than is needed is inefficient because it provides an insufficient amount of assistance to improve payment patterns.

An arrearage management program: An arrearage management program addresses unpaid balances that were incurred during a time in which a utility was delivering unaffordable

bills. It makes little sense, however, to cap bills for current service at an affordable percentage of income if a low-income customer's ***total*** bill will nonetheless still be unaffordable due to the need to retire pre-existing arrears. The notion of an affordable bill for current service and an arrearage management program can be melded together. Instead of providing forgiveness for ***all*** pre-existing arrearages, a utility can require a customer co-payment toward his or her arrearages equal to a percentage of income. By structuring an arrearage management component in this fashion a utility accomplishes two objectives.

- *First*, the utility enforces ***some*** payment responsibility for the previously-issued bills, but not such a high responsibility that payment of the total bill would be placed in jeopardy. A low-income customer should not bear ***zero*** responsibility for such bills. Simply because a portion of the prior bill was unaffordable does not mean that the entire bill was unaffordable.

- *Second*, structuring arrearage co-payments based on a percentage of income keeps the co-payment consistent with the entire notion of affordability. Customers with higher incomes can afford to pay more –even if the percentage of income is the same across all income levels, the dollar responsibility is not—and is thus required to take on greater responsibility for retiring pre-existing arrears. A 1% arrearage co-payment would result in a customer with an income of $10,000 paying $200 toward their arrearage over two years, while it would result in a customer with an income of $7,000 being required to pay only $140.

A crisis intervention program: A crisis intervention program is a necessary component of a Bill Affordability Program notwithstanding an affordable bill discount. In addition to the ***level*** of income of low-income customers is the ***inconsistency*** of income (often referred to as the "fragility" of income). Low-income workers tend to be hourly wage employees, having lower quality jobs. These workers often have periods where hours are reduced in a pay period, a practice called "involuntary part-time employment." Low income, hourly wage, employees also frequently, if not nearly universally, lack paid leave time, such as sick leave, family leave, or vacation leave. Correspondingly, they lack flex work hours. Missing two days of work to care for a sick child, in such circumstances, results in a permanent loss of wages.

Finally, low-income customers tend to be what is called "liquid asset poor." They generally do not have sufficient incomes to set aside some to build a saving account that can cushion a period of lost or reduced income (or an unexpected household expense such as a medical or dental bill). In sum, even given the ability of a discount to cap bills at an affordable level under normal circumstances, it can reasonably be expected that a certain number (or proportion) of low-income bill discount recipients to be unable to consistently pay their bill when circumstances are not "normal."

Usage reduction investments: Finally, usage reduction is an essential component of a Bill Affordability Program. Usage reduction investments assist from both the customer's perspective and the utility's perspective. From the customer's perspective, usage reduction may well be able to reduce the customer's bill below the affordable percentage of income. Given such results, while the customer would no longer receive a discount –remember, the discount is provided only up to the point where it caps the bill at an affordable percentage of income—their bill would nonetheless be lower, both in absolute dollars and as a percentage of income. In contrast, from the utility's perspective, every dollar of bill reduction associated with a usage reduction program is a dollar of reduced discount that is being provided. Even if a customer does not reduce his or her bill to less than the affordable percentage of income, the utility is reducing the aggregate amount of the discount being paid.

Each of the four necessary components of a Bill Affordability Program –an affordable bill discount; an arrearage management component; a crisis intervention component; and a usage reduction investment—is part of an integrated whole. All four program components should be adopted in Connecticut in the manner described throughout this paper.

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