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**Non-Energy Impacts Vastly Improve Cost-Effectiveness of Low-Income Efficiency Investments. (part 3 of 3)**

NOTE TO READERS

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**The Non-Energy Impacts ("NEIs") of Low-Income Energy Efficiency are Frequently Understated.**

The last two issues of FSC's Law and Economics Insights (September/October and November/December 2017) have discussed the policy reasons for incorporating Non-Energy Impacts (NEIs) into the cost-effectiveness analyses of low-income energy efficiency investments and a considerable set of research that has documented and dollarized these NEIs.

This issue of the Law and Economics Insights continues that discussion by citing examples of ways in which even the research that was cited in November/December 2017 tends to *understate* NEIs that have been identified and quantified for low-income households.

**An Introductory Overview.**

The determination of an NEI is a multi-tier process. One of those steps is to assign a value to a particular attribute. Another of those steps is to determine the incidence of the attribute in the low-income energy efficiency recipient population. The previous issue discussed in some detail, for example, how the most recent Massachusetts valuation of Health and Safety NEIs acknowledges in the text of its report how it under-estimated certain values, particularly as they relate to low-income households.

The discussion below introduces several more illustrations (this is certainly not a comprehen-

sive listing) of how low-income NEIs have been under-stated. The discussion focuses below on (1) the health and safety benefits of avoided fires; (2) on the value of reduced forced absences from a home; and (3) on the participant-perspective benefits of reduced disconnections and reconnections.

### **Health and Safety of Avoided Fires.**

The benefits of reduced fires, along with the accompanying reduction in personal injury and property damage, have been well-documented in research regarding NEIs. The quantification of reduced numbers of fires, however, has focused exclusively on how energy efficiency investments improve the equipment that is being replaced through the efficiency programs.

In the low-income community, however, fire hazards also arise from the loss of service due to nonpayment or due to the increased use of space heaters because the use of central heating systems is perceived to be too expensive. Alternatives that low-income households use to disconnected lights also present fire hazards. The periodic survey that the National Energy Assistance Directors Association (“NEADA”) performs for Congress provides the data. The 2011 NEADA survey reports that more than one-quarter of low-income households, for example, used candles or lanterns in the last year because their electric service had been disconnected.

Moreover, a study that FSC performed for the National Fuel Funds Network (“NFFN”) in 2001 reported that many low-income customers who lose their primary heating service due to nonpayment turn to secondary sources of heating such as portable space heaters. That study found:

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. 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. Indeed, portable electric heaters have accounted for the highest home heating fire death toll in 10 of the past 14 years. No other cause of home heating fires comes even close to the fatality rate caused by portable heaters and fixed space heaters. In usage-weighted terms, while portable heaters do not cause more fires than central heating units, they are associated with significantly more deaths, more injuries, and more direct property damage, than are central units.<sup>1</sup>

As is evident, the literature quantifying fewer deaths, personal injuries, and property damages due to the replacement of defective home heating systems through energy efficiency programs, while accurate to the extent that it goes, undervalues the extent of fire reduction that can be attributed to energy efficiency for low-income customers. The National Fire Prevention Association (“NFPA”) reports that “not being able to afford utilities” is one of the “major factors of increased fire risks” for low-income house-

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<sup>1</sup> Roger Colton (2001). *In Harm’s Way: Home Heating, Fire Hazards, and Low-Income Households*, at 1-2 (internal notes omitted).

holds.<sup>2</sup>

Moreover, the literature quantifying the dollar value of reduced fire hazards attributable to energy efficiency does not account for the special exposure that low-income households have to personal injury and death. The NFPA reports that fires in low-income homes are more likely to result in death and/or injury, particularly of children, because of: (1) not always being able to afford child care and leaving children unattended or unsupervised; (2) not being able to afford a telephone; and (3) living in less fire resistant housing, as well as using less fire resistant furniture and mattresses.<sup>3</sup>

It is important to understand that these fire risks do not arise simply from the disconnection of utility service, but rather from the unaffordability of utility service. Reducing bills through energy efficiency will help reduce these fire risks and will give rise to increased NEIs. This occurs as a result of the energy efficiency apart from the replacement or repair of home heating systems.

#### **The Avoided Forced Absence from a Home.**

The literature quantifying NEIs has been found to develop methodologically sound, and reasonably consistent, dollar values for the frequent mobility caused by unaffordable home energy and the loss of home utility service. These values are more likely to appertain to low-income households.

What the literature does *not* address is how en-

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<sup>2</sup> “Burning Issues,” *NFPA Journal*, at 104 (January/February 1996).

<sup>3</sup> Rita Fahy and Alison Norton, “How Being Poor Affects Fire Risk. . .” *Fire Journal*, at 29:34 (January/February 1989).

ergy efficiency, by making home energy service more affordable, can be used to reduce the forced absences that low-income households experience. That reduction in forced absences will have a value greater than \$0.<sup>4</sup>

The existence of this forced absence has been well-documented. The most recent NEADA survey of fuel assistance recipients reported that more than one-in-five respondents reported that, within the previous year, they left home for all or part of a day because the home was too hot or too cold due to their inability to pay their home energy bill. To the extent that energy efficiency can improve the home energy affordability, the incidence of this forced absence will be reduced. Again, however, more than documenting a precise value for this non-energy impact, the purpose here is simply to note that the value is greater than \$0 and that it is uniquely associated with low-income (rather than non-low-income) efficiency recipients.

#### **Reduced Number of Utility Service Disconnections and Reconnections.**

A participant-perspective NEI has been calculated for the reconnection of service subsequent to the disconnection of service for nonpayment. The value that has been placed on the reconnection of service, however, has been limited to the dollar value of the reconnection fee imposed by the utility.

The actual value of a reduced number of reconnections is greater than that. As found in FSC’s study of the economic development impacts of

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<sup>4</sup> My objective here is not to establish the increased value, but rather to simply document that there are factors that make the participant perspective NEIs for low-income households higher than the participant perspective NEIs for non-low-income.

fuel assistance and weatherization, “the reconnection of service does not ‘just happen’ after service has been terminated for nonpayment. The actions a customer must take to find money, contact the utility, make payment arrangements, and await the physical reconnection all take time.”

The lost work time devoted to the reconnection of service represents lost wages to the household. Previous studies of the lost work time devoted to the reconnection of service after a disconnection have found that households lose eight hours of work time.<sup>5</sup> The value of the non-energy impact of reduced numbers of disconnection (and thus reconnections) extends well beyond only the dollar value of any reconnection fee. The value extends, also, to the avoided time devoted to arranging the payment resulting in the reconnection.

### Utility-Perspective NEIs.

As the NMR Massachusetts study documents, many of the utility-perspective NEIs relate primarily, if not exclusively, to low-income programs. The adder components relating to avoided working capital, avoided bad debt, avoided disconnection and reconnection costs, and avoided collection call costs, are related to addressing the payment problems of low-income customers.

In addition, since New Hampshire offers a low-income electric discount, a low-income adder would need to reflect the avoided costs of the discounts that would have been provided on the

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<sup>5</sup> Roger Colton (2003). *The Economic Development Impacts of Energy Assistance: The Entergy States*, at 15, prepared for Entergy Services (internal citations omitted).

reduced consumption. Each of these additional NEIs specific to low-income customers counsels for an increased adder when applied to low-income energy efficiency programs.

### Summary and Conclusions

Based on the above data and analysis, FSC concluded that the New Hampshire PUC should incorporate NEIs into the state’s analyses of the cost-effectiveness of low-income energy efficiency programs. FSC further concluded that the use of adders was an appropriate mechanism through which NEIs can be quantified and incorporated.

For more information regarding low-income Non-Energy Impacts, or for a copy of Colton’s New Hampshire 2017 testimony, please write:

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