

Non-Energy Impacts (NEIs)

Delaware EEAC

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Non-Energy Impacts (NEIs)

- Widely recognized effect of Energy Efficiency (EE) programs
- Over 20 years of research
- Three types of beneficiaries
 - Utilities / Program Administrators (and their ratepayers)
 - Society
 - Program participants
 - Some measured directly
 - Others self-reported

Brief History of NEI Research

- Began in early 1990s
 - Early focus: utility NEIs
 - 1993 study of Weatherization Assistance Program (WAP)
- Mid-1990s –
 - Increased focus on participant NEI research
 - Some use more complicated methods of quantification

Utility NEIs

- Low-income programs
- Direct monetary savings for utilities
 - Reduced energy bills → program participants better able to pay energy bills → financial savings for utilities
 - Relatively low in value (<\$10 per participant)
- Relatively easy to quantify with utility records
- Reduced costs associated with:
 - Arrearages and late payments
 - Uncollectible bills and bad debt write-offs
 - Service terminations and reconnections
 - Bill-related customer calls
 - Bill collections process
 - Rate discounts
 - Safety-related emergency calls

Participant NEIs

- Wide range in values
 - Water savings (low) to health impacts (high)
- Quantification methods and complexity vary widely
 - Easier: Water
 - Utility data, secondary data, and algorithms found in the literature
 - More complex: Health Impacts
 - Self-reported (survey or interview), contingent valuation
 - Pre-post survey with control group, plus secondary data on medical costs

Participant NEIs

- Vary by type of participant
 - Residential and low-income
 - Wide range:
 - Water savings, health, safety, equipment maintenance, reduced noise, etc.
 - Commercial and Industrial (C&I) and owners of multifamily buildings (MF)
 - Generally - reduced O&M costs
 - Labor and materials
 - Can also include:
 - Waste disposal
 - Spoilage or defects
 - Sales revenue
 - Worker health and productivity

Societal NEIs

- Impacts to society at large
- Research has focused on:
 - Environmental
 - Avoided air emissions
 - Economic impacts
 - Jobs created
- Moderately complex methods to quantify
- Additional, rarely quantified societal NEIs
 - Cost savings to social service agencies
 - Reduced costs to the medical system
 - Equity benefits for low-income populations

Value of NEIs

- Utility: lower value
 - Often range from 10% to 25% of bill savings (\$)
- Participant: high value
 - Residential: comfort, equipment maintenance, property value, health
 - C&I: O&M
- Societal: high value
 - Emissions and economic development

Other States: Overview

- At least 20 states count or have approved NEIs
- Method of including NEIs in B/C tests:
 - Adders: % or \$ value ‘added’ to benefits in B/C test
 - Examples: VT, DC, IL, OR
 - ‘Easily Measured’ or ‘Well Defined’: regulators approve smaller set of individual NEIs
 - Examples: AR, MD, NY
 - Wide range of NEIs: regulators approve broad set of NEIs
 - Examples: MA, RI

Other States: Massachusetts

- Wide range of utility and participant NEIs in B/C tests
 - Health, equipment maintenance, thermal comfort, reduced noise, etc.
- Substantial percent of benefits in current 3-year electric plans (2016-18)
 - Residential programs: 12%
 - Low-income programs: 26%
 - C&I programs: 14%
 - Overall: 14%

Other States: Arkansas

- Working group identified NEIs for B/C tests
- December 2015: Commission approved 3 NEI categories
 - Other fuel savings (i.e., natural gas; liquid propane)
 - Public water and wastewater savings; and
 - Avoided and deferred equipment replacement costs
- Begin use in 2017

Other States: Maryland

- July 2015: MD PSC Order approved use of several NEIs
 - Comfort
 - C&I O&M
 - Reduced arrearages (LI)
 - Avoided air emissions (societal cost test)

Delaware: Council Approved NEIs

Category or type of NEI	Value (2016\$)	Source	Notes
Weatherization			
LI Weatherization	\$182 per home (annual)	Three ³ (2016)	Participant health and safety benefits, no avoided death value; ultimately based on national WAP evaluation.
LI Weatherization reduced arrearages	2% of participant bill savings	Itron (2014); MD PSC (2015)	Published estimates for relevant programs
Non-LI HPwES/shell measures/etc	\$35.35 per home (annual)	Itron (2014); MD PSC (2015)	Low case, derived from data in 2011 Massachusetts study; included in MD PSC order
Air emissions			
Air emissions externalities	\$0.0090 per kWh (annual)	PJM (2015); DPL IRP (2014)	Based on low end of avoided costs for NO _x and SO ₂ from DPL IRPs (2012 and 2014) and reported PJM emissions rates for 2014/5, emissions de-rated by 75%, and inflated to 2016\$. Does not include compliance costs for NO _x /SO ₂
Other Benefits			
Water savings	\$5 per 1,000 gallons	Conservative value based on AWWA (2016) and U of Delaware (2014)	Water savings indicated in the TRM should be valued at this rate; water savings can also be estimated using using IPMVP Method C and valued at this rate.
O&M savings	As specified in the TRM	Delaware TRM	

Delaware: Council Approved NEIs

- Incorporating NEIs into DE programs
 - Some are program or sector specific
 - LI Weatherization:
 - Health and safety
 - Reduced arrearages
 - Others apply to all programs
 - Air emissions (all electricity savings)
 - Measure specific, across all programs and sectors:
 - Water savings

Thank You

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