

## Appendix C: Non-Energy Impacts

### Per Measure Residential Non-Energy Impacts for Electric and Gas Programs

End Use	TRM Measures	NEI	Description	Value or Algorithm	Basis	Duration
Lighting	Indoor Fixture	Lighting Quality and Lifetime	O&M savings due to more efficient fixtures	\$3.50	per measure	One Time
	Outdoor Fixture					
	LED Fixture	Lighting Quality and Lifetime	O&M savings due to more efficient bulbs	\$3.00	per measure	One Time
	CFL Bulb					
	LED Bulb					
Products	Refrigerator/Freezer Recycling	Refrigerator/Freezer Turn-in	Non-energy benefits of turning in a refrigerator and/or freezer as part of the MA turn-in program. The total benefit is comprised of 3 parts: \$1.06 for avoided landfill space, \$1.25 for recycling of plastics and glass, and \$170.22 for incineration insulating foam.	\$172.53	per measure	One Time
HVAC	Heating System (Retrofit and Rebate)	Improved Safety	Reduced incidence of fire and carbon monoxide exposure as a result of installing a new heating system	\$45.05	per measure	Annual
	Window AC (Retrofit)	Window Air Conditioner Replacement	Non-energy benefits associated with installing a new room air conditioner replacement	\$49.50	per measure	Annual

End Use	TRM Measures	NEI	Description	Value or Algorithm	Basis	Duration
Various	All Measures with oil savings	National Security	Reducing the need for foreign energy imports thereby increasing national security	MMBTU Oil Savings * \$1.83	per measure	Annual
	All electric measures with kWh savings and all gas measures with MMBTU savings.	Rate Discounts	Financial savings to utility as a result of a smaller portion of energy being sold at the low income rate	<b>Elec:</b> (kwh savings per measure)*(A16-A60) <b>Gas:</b> (therms savings per measure)*(R12-R13)	per measure	Annual

(1) The NEIs in this table represent impacts that accrue specifically measures in the 2014 RI portfolio of programs.

**Per Measure Commercial and Industrial Non-Energy Impacts for Electric and Gas Programs**

<b>End Use</b>	<b>TRM Measures</b>	<b>NEI</b>	<b>Description</b>	<b>Value</b>	<b>Basis</b>	<b>Type</b>
Lighting	Large Retrofit Prescriptive Lighting	Varies (1)	A compiled value representing a number of NEI categories studied in the referenced evaluation.	\$0.027	Net kWh Saved	Annual
	New Construction CFL O&M	O&M Savings (2)	Operation & Maintenance savings from fewer replacements over the life of the more efficient measure	\$17.93	Unit	Annual
	New Construction LED Traffic Light O&M	O&M Savings (2)	Operation & Maintenance savings from fewer replacements over the life of the more efficient measure	\$30.02	Unit	Annual
	New Construction Control/Sensor O&M	O&M Savings (2)	Operation & Maintenance savings from fewer replacements over the life of the more efficient measure	\$6.69	kW Saved	Annual
Electric HVAC	Large Retrofit Prescriptive HVAC	Multiple (1)	A compiled value representing a number of NEI categories studied in the referenced evaluation.	\$0.097	Net kWh Saved	Annual
Electric Custom	Large Retrofit Custom Electric	Multiple (1)	A compiled value representing a number of NEI categories studied in the referenced evaluation.	\$0.037	Net kWh Saved	Annual

End Use	TRM Measures	NEI	Description	Value	Basis	Type
CHP	Large Retrofit CHP	Economic development	Economic development benefits, as required by the amendment to the Least Cost Procurement law, R.I.G.L. § 39-1-27.7(c)(6)(ii) – (iv) enacted in June 2012	\$0.39	Net kWh Saved	One-Time
		Multiple (1)	A compiled value representing a number of NEI categories studied in the referenced evaluation.	-\$0.015	Net kWh Saved	Annual
Gas HVAC	Retrofit Boiler, Reset Controls, Retrofit Thermostat	Multiple (1)	A compiled value representing a number of NEI categories studied in the referenced evaluation.	\$0.135	Net kWh Saved	Annual
Gas Custom	Large Retrofit Custom Gas	Multiple (1)	A compiled value representing a number of NEI categories studied in the referenced evaluation.	\$0.250	Net kWh Saved	Annual

(1) Source is Tetra Tech Inc. "Massachusetts Program Administrators Final Report - Commercial & Industrial Non-Energy Impacts Study, 6/29/2012

(2) (2) Source is Optimal Energy, Inc. MEMO "Non-Electric Benefits Analysis Update" 11/7/2008

## Per Participant Non-Energy Impacts for Residential Electric Measures

Program	NEI	Description	Measure Category	Value	Duration
Residential New Construction	Thermal Comfort	Greater participant-perceived comfort in home	N/A	\$77.00	Annual
	Noise Reduction	Less participant-perceived noise in the home		\$40.00	Annual
	Property Value Increase	Increased value of property and expected ease of selling home		\$72.00	Annual
Residential Cooling and Heating Equipment	Thermal Comfort	Greater participant-perceived comfort in home	Heating System	\$48.63	Annual
			Cooling System	\$3.92	
			Heating and Cooling System	\$5.05	
	Noise Reduction	Less participant-perceived noise in the home	Cooling System	\$2.83	Annual
			Heating and Cooling System	\$1.42	
	Home Durability	Increased home durability from better quality heating, cooling and structural materials	Heating System	\$17.42	Annual
	Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Cooling System	\$1.54	
Heating and Cooling System			\$1.98		
Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity from weatherization	Heating System	\$102.40	Annual	
		Cooling System	\$7.54		
		Heating and Cooling System	\$9.42		
Property Value Increase	Increased value of property and expected ease of selling home	Heating System	\$1.56	Annual	
		Cooling System	\$0.13		
		Heating and Cooling System	\$0.16		
		Heating System	\$678.52		One Time
Cooling System	\$62.65				
Heating and Cooling System	\$80.69				
Air Sealing	\$0.32				
Air Sealing	\$135.83				

Program	NEI	Description	Measure Category	Value	Duration
Single Family - Income Eligible Services	Arrearages	Reduced arrearage carrying costs as a result of customers being more able to pay their lower bills	N/A	\$2.61	Annual
	Bad Debt Write-offs	Reduced costs to utility of uncollectable, unpaid balances as a result of customers being more able to pay their lower bills		\$3.74	Annual
	Terminations and Reconnections	Reduced costs associated with terminations and reconnections to utility due to nonpayment as a result of customers being more able to pay their lower bills		\$0.43	Annual
	Customer Calls and Collections	Utility savings in staff time and materials for fewer customer calls as a result of more timely bill payments		\$0.58	Annual
	Notices	Financial savings to utility as a result of fewer notices sent to customers for late payments and terminations		\$0.34	Annual
	Thermal Comfort	Greater participant-perceived comfort in home	Insulation Air Sealing Heating System	\$25.38 \$30.23 \$28.01	Annual
	Noise Reduction	Less participant-perceived noise in the home	Insulation Air Sealing	\$13.56 \$16.39	Annual
	Home Durability	Increased home durability from better quality heating, cooling and structural materials	Insulation Air Sealing Heating System	\$8.76 \$10.61 \$9.72	Annual
	Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Heating System	\$27.43	Annual
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity from weatherization	Insulation Air Sealing Heating System	\$4.77 \$5.69 \$5.27	Annual

Program	NEI	Description	Measure Category	Value	Duration
Single Family - Income Eligible Services	Property Value Increase	Increased value of property and expected ease of selling home	Insulation Air Sealing Heating System	\$223.63 \$144.93 \$249.20	Annual
	Safety-Related Emergency Calls	Financial savings to the utility as a result of fewer safety related emergency calls being made	Heating System	\$8.43	Annual
EnergyWise Single Family and Multifamily	Thermal Comfort	Greater participant-perceived comfort in home	Insulation	\$25.15	Annual
			Air Sealing	\$10.13	
	Noise Reduction	Less participant-perceived noise in the home	Insulation	\$11.54	Annual
			Air Sealing	\$4.88	
	Home Durability	Increased home durability in terms of maintenance requirements because of better quality heating, cooling and structural materials	Insulation	\$9.82	Annual
			Air Sealing	\$3.95	
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity as a result of weatherization in home	Insulation	\$0.80	Annual
			Air Sealing	\$0.32	
	Property Value Increase	Increased value of property and expected ease of selling home	Insulation	\$378.05	One Time
			Air Sealing	\$135.83	

Program	NEI	Description	Measure Category	Value	Duration
EnergyWise Income Eligible Multifamily Retrofit	Rental Units Marketability	Financial savings to owners of LI rental housing as a result of increased marketability of the more efficient housing.	N/A	\$0.96	Annual
	Property Durability	Financial savings to owners of LI rental housing as a result of more durable and efficient materials being installed.		\$36.85	Annual
	Reduced Tenant Complaints	Savings to owners of LI rental housing in terms of staff time and materials as a result of fewer tenant complaints with the more efficient measures.		\$19.61	Annual
	Rental Unit Increased Property Value	Owner-perceived increased property value due to more energy efficient measures		\$17.03	One Time
	Arrearages	Reduced arrearage carrying costs as a result of customers being more able to pay lower bills		\$2.61	Annual
	Bad Debt Write-offs	Reduced costs to utility of uncollectable, unpaid balances as a result of customers being more able to pay their lower bills		\$3.74	Annual
	Terminations and Reconnections	Reduced costs associated with terminations and reconnections to utility due to nonpayment as a result of customers being more able to pay their lower bills		\$0.43	Annual
	Customer Calls and Collections	Utility savings in staff time and materials for fewer customer calls as a result of more timely bill payments		\$0.58	Annual
	Notices	Financial savings to utility as a result of fewer notices sent to customers for late payments and terminations		\$0.34	Annual



<b>Program</b>	<b>NEI</b>	<b>Description</b>	<b>Measure Category</b>	<b>Value</b>	<b>Duration</b>
EnergyWise Income Eligible Multifamily Retrofit	Thermal Comfort	Greater participant-perceived comfort in home	Insulation Air Sealing	\$25.38 \$30.23	Annual
	Noise Reduction	Less participant-perceived noise in the home	Insulation Air Sealing	\$13.56 \$16.39	Annual
	Home Durability	Increased home durability in terms of maintenance requirements because of better quality heating, cooling and structural materials	Insulation Air Sealing	\$8.76 \$10.61	Annual
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity as a result of weatherization in home	Insulation Air Sealing	\$4.77 \$5.69	Annual
	Property Value Increase	Increased value of property and expected ease of selling home	Insulation Air Sealing	\$223.63 \$144.93	Annual

1) Source of NEIs is "Massachusetts Program Administrators: Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation," NMR Group, Inc., Tetra Tech. 8.15.2011

## Per Participant Non-Energy Impacts for Residential Gas Programs

Program	NEI	Description	Measure Category	Value	Duration
Residential Heating and Hot Water	Thermal Comfort	Greater participant-perceived comfort in home	Heating System	\$48.63	Annual
			Heating and Hot Water System	\$1.83	
	Home Durability	Increased home durability in terms of maintenance requirements because of better quality heating, cooling and structural materials	Heating System	\$17.42	Annual
			Hot Water System	\$2.13	
	Heating and Hot Water System	\$0.72			
Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Heating System	\$102.40	Annual	
Heating and Hot Water System	\$3.41				
Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity from weatherization	Heating System	\$1.56	Annual	
		Heating and Hot Water System	\$0.06		
Property Value Increase	Increased value of property and expected ease of selling home	Heating System	\$678.52	One Time	
		Hot Water System	\$82.56		
		Heating and Hot Water System	\$29.17		
EnergyWise Single Family	Thermal Comfort	Greater participant-perceived comfort in home	N/A	\$25.00	Annual
	Noise Reduction	Less participant-perceived noise in the home		\$11.22	Annual
	Home Durability	Increased home durability from better quality heating, cooling and structural materials		\$9.57	Annual
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity from weatherization		\$0.79	Annual
	Property Value Increase	Increased value of property and expected ease of selling home		\$381.28	One Time

<b>Program</b>	<b>NEI</b>	<b>Description</b>	<b>Measure Category</b>	<b>Value</b>	<b>Duration</b>
EnergyWise Multi Family	Thermal Comfort	Greater participant-perceived comfort in home	Insulation	\$25.15	Annual
			Air Sealing	\$10.13	
	Noise Reduction	Less participant-perceived noise in the home	Insulation	\$11.54	Annual
			Air Sealing	\$4.88	
	Home Durability	Increased home durability in terms of maintenance requirements because of better quality heating, cooling and structural materials	Insulation	\$9.82	Annual
			Air Sealing	\$3.95	
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity as a result of weatherization in home	Insulation	\$0.80	Annual
			Air Sealing	\$0.32	
	Property Value Increase	Increased value of property and expected ease of selling home	Insulation	\$378.05	One Time
			Air Sealing	\$135.83	

Program	NEI	Description	Measure Category	Value	Duration
Single Family - Income Eligible Services	Safety-Related Emergency Calls	Financial savings to the utility as a result of fewer safety related emergency calls being made	Heating System	\$8.43	Annual
	Thermal Comfort	Greater participant-perceived comfort in home	Insulation	\$25.38	Annual
			Air Sealing	\$30.23	
			Heating System	\$28.01	
	Noise Reduction	Less participant-perceived noise in the home	Insulation	\$13.56	Annual
			Air Sealing	\$16.39	
	Home Durability	Increased home durability in terms of maintenance requirements because of better quality heating, cooling and structural materials	Insulation	\$8.76	Annual
			Air Sealing	\$10.61	
Heating System			\$9.72		
Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Heating System	\$27.43	Annual	
Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity as a result of weatherization in home	Insulation	\$4.77	Annual	
		Air Sealing	\$5.69		
		Heating System	\$5.27		
Property Value Increase	Increased value of property and expected ease of selling home	Insulation	\$223.63	One Time	
		Air Sealing	\$144.93		
		Heating System	\$249.20		

Program	NEI	Description	Measure Category	Value	Duration
Single Family - Income Eligible Services	Arrearages	Reduced arrearage carrying costs as a result of customers being more able to pay their lower bills	N/A	\$2.61	Annually
	Bad Debt Write-offs	Reduced costs to utility of uncollectable, unpaid balances as a result of customers being more able to pay their lower bills		\$3.74	Annually
	Terminations and Reconnections	Reduced costs associated with terminations and reconnections to utility due to nonpayment as a result of customers being more able to pay their lower bills		\$0.43	Annually
	Customer Calls and Collections	Utility savings in staff time and materials for fewer customer calls as a result of more timely bill payments		\$0.58	Annually
	Notices	Financial savings to utility as a result of fewer notices sent to customers for late payments and terminations		\$0.34	Annually

Program	NEI	Description	Measure Category	Value	Duration
EnergyWise Income Eligible Multifamily Retrofit	Rental Units Marketability	Financial savings to owners of LI rental housing as a result of increased marketability of the more efficient housing.	Air Sealing	\$0.07	Annual
	Property Durability	Financial savings to owners of LI rental housing as a result of more durable and efficient materials being installed.	Air Sealing	\$2.58	Annual
	Reduced Tenant Complaints	Savings to owners of LI rental housing in terms of staff time and materials as a result of fewer tenant complaints with the more efficient measures.	Air Sealing	\$1.37	Annual
	Rental Unit Increased Property Value	Owner-perceived increased property value due to more energy efficient measures	Air Sealing	\$1.19	One Time
	Arrearages	Reduced arrearage carrying costs as a result of customers being more able to pay their lower bills	N/A	\$2.61	Annual
	Bad Debt Write-offs	Reduced costs to utility of uncollectable, unpaid balances as a result of customers being more able to pay their lower bills		\$3.74	Annual
	Terminations and Reconnections	Reduced costs associated with terminations and reconnections to utility due to nonpayment as a result of customers being more able to pay their lower bills		\$0.43	Annual
	Customer Calls and Collections	Utility savings in staff time and materials for fewer customer calls as a result of more timely bill payments		\$0.58	Annual
	Notices	Financial savings to utility as a result of fewer notices sent to customers for late payments and terminations		\$0.34	Annual

Program	NEI	Description	Measure Category	Value	Duration
EnergyWise Income Eligible Multifamily Retrofit	Safety-Related Emergency Calls	Financial savings to the utility as a result of fewer safety related emergency calls being made	Heating System	\$8.43	Annual
	Thermal Comfort	Greater participant-perceived comfort in home	Insulation	\$25.38	Annual
			Air Sealing	\$30.23	
			Heating System	\$28.01	
	Noise Reduction	Less participant-perceived noise in the home	Insulation	\$13.56	Annual
			Air Sealing	\$16.39	
	Home Durability	Increased home durability in terms of maintenance requirements because of better quality heating, cooling and structural materials	Insulation	\$8.76	Annual
			Air Sealing	\$10.61	
			Heating System	\$9.72	
	Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Heating System	\$27.43	Annual
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity as a result of weatherization in home	Insulation	\$4.77	Annual
			Air Sealing	\$5.69	
			Heating System	\$5.27	
	Property Value Increase	Increased value of property and expected ease of selling home	Insulation	\$223.63	One Time
			Air Sealing	\$144.93	
Heating System			\$249.20		

(1) Source of NEIs is "Massachusetts Program Administrators: Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation," NMR Group, Inc., Tetra Tech. 8.15.2011