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 Outdoor Fixture	Lighting Quality and Lifetime	O&M savings due to more efficient fixtures	\$3.50	per measure	One Time
Digitting	LED Fixture CFL Bulb LED Bulb	Lighting Quality and Lifetime	O&M savings due to more efficient bulbs	\$3.00	per measure	One Time
Products	Refrigerator/Freez er Recycling	Refrigerator/Freeze r 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
	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
Various	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	Elec: (kwh savings per measure)*(A16-A60) Gas: (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

End Use	TRM Measures	NEI	Description	Value	Basis	Type
	Large Retrofit Prescriptive	W. (1)	A compiled value representing a number of NEI categories studied in	¢0.027	Net kWh	Annual
	New Construction	Varies (1) O&M Savings (2)	the referenced evaluation. Operation & Maintenance savings from fewer replacements over the life of the more efficient measure	\$0.027 \$17.93	Saved Unit	Annual
Lighting	New Construction LED Traffic Light	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 Savings (2)	Operation & Maintanence 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
			Economic development			
			benefits, as required by the			
			amendment to the Least			
			Cost Procurement law,			One-Time
	Large Retrofit		R.I.G.L. § 39-1-		Net	
CHP	CHP	Economic	27.7(c)(6)(ii) - (iv)		kWh	
	СПГ	development	enacted in June 2012	\$0.39	Saved	
			A compiled value			
			representing a number of		Net	Annual
			NEI categories studied in		kWh	Aiiiuai
		Multiple (1)	the referenced evaluation.	-\$0.015	Saved	
	Retrofit Boiler,		A compiled value			
Gas HVAC	Reset Controls,		representing a number of		Net	Annual
Gas II v AC	Retrofit		NEI categories studied in		kWh	Aiiiuai
	Thermostat	Multiple (1)	the referenced evaluation.	\$0.135	Saved	
			A compiled value			
Gas Custom			representing a number of		Net	Annual
	Large Retrofit		NEI categories studied in		kWh	Ailliual
	Custom Gas	Multiple (1)	the referenced evaluation.	\$0.250	Saved	

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

⁽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	
	Thermal Comfort	Greater participant-perceived comfort in home		\$77.00	Annual	
Residential New Construction	Noise Reduction	Less participant-perceived noise in the home	N/A	\$40.00	Annual	
Construction	Property Value Increase	Increased value of property and expected ease of selling home		\$72.00	Annual	
			Heating System	\$48.63		
	Thermal Comfort	Greater participant-perceived comfort in home	Cooling System	\$3.92	Annual	
			Heating and Cooling System	\$5.05		
	M. D. L.	I ass newticinent measured noise in the home	Cooling System	\$2.83	A mm., o1	
	Noise Reduction	Less participant-perceived noise in the home	Heating and Cooling System	\$1.42	Annual	
		In any of the second section of the	Heating System	\$17.42		
	Home Durability	Increased home durability from better quality heating, cooling and structural materials	Cooling System	\$1.54	Annual	
		neating, cooling and structural materials	Heating and Cooling System	\$1.98		
			Heating System	\$102.40		
Residential Cooling and	Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Cooling System	\$7.54	Annual	
Heating Equipment		and/or more efficient appliance equipment	Heating and Cooling System	\$9.42		
		Fewer colds and viruses, improved indoor air	Heating System	\$1.56		
	Health Benefits	quality and ease of maintaining healthy relative	Cooling System	\$0.13	Annual	
		humidity from weatherization	Heating and Cooling System	\$0.16		
			Heating System	\$678.52		
			Cooling System	\$62.65		
	Property Value Increase	Increased value of property and expected ease of	Heating and Cooling System	\$80.69	One Time	
	Troperty value increase	selling home	Air Sealing	\$0.32	one rime	
			Air Sealing	\$135.83		

Program	NEI	Description	Measure Category	Value	Duration
	Arrearages	Reduced arrearage carrying costs as a result of customers being more able to pay their 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	N/A	\$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
Single Family - Income Eligible Services	Notices	Financial savings to utility as a result of fewer notices sent to customers for late payments and terminations		\$0.34	Annual
Services			Insulation	\$25.38	
	Thermal Comfort	Greater participant-perceived comfort in home	Air Sealing	\$30.23	Annual
			Heating System	\$28.01	
	Noise Reduction	Less participant-perceived noise in the home	Insulation	\$13.56	Annual
			Air Sealing	\$16.39	
	H D 137	Increased home durability from better quality	Insulation	\$8.76	. 1
	Home Durability	heating, cooling and structural materials	Air Sealing	\$10.61	Annual
	Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Heating System Heating System	\$9.72 \$27.43	Annual
		Fewer colds and viruses, improved indoor air	Insulation	\$4.77	
	Health Benefits	quality and ease of maintaining healthy relative	Air Sealing	\$5.69	Annual
	Hourin Denomia	humidity from weatherization	Heating System	\$5.27	7 miliuui

Program	NEI	Description	Measure Category	Value	Duration	
	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	
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 Air Sealing	\$25.15 \$10.13	Annual	
	Noise Reduction	Less participant-perceived noise in the home	Insulation	\$11.54	Annual	
		Increased home durability in terms of	Air Sealing Insulation	\$4.88 \$9.82		
EnergyWise Single Family and Multifamily	Home Durability	maintenance requirements because of better quality heating, cooling and structural materials	Air Sealing	\$3.95	Annual	
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative	Insulation	\$0.80	Annual	
		humidity as a result of weatherization in home	Air Sealing	\$0.32	7 1111001	
	Property Value Increase	Increased value of property and expected ease	Insulation	\$378.05	One Time	
		of selling home	Air Sealing	\$135.83	One fine	

Program	NEI	Description	Measure Category	Value	Duration
	Rental Units Marketability	Financial savings to owners of LI rental housing as a result of increased marketability of the more efficient housing.		\$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
EnergyWise Income Eligible	Arrearages	Reduced arrearage carrying costs as a result of customers being more able to pay lower bills	N/A	\$2.61	Annual
Multifamily Retrofit	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	IN/A	\$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	
	Thermal Comfort	Greater participant-perceived comfort in home	Insulation	\$25.38	Annual	
		Greater participant-perceived conflort in nome	Air Sealing	\$30.23	Aiiiuai	
	Noise Reduction	Less participant-perceived noise in the home	Insulation	\$13.56	Annual	
	Noise Reduction	Less participant-perceived noise in the nome	Air Sealing	\$16.39	Annual	
EnergyWise	Home Durability requirements because or cooling and structural m Fewer colds and viruses quality and ease of main	Increased home durability in terms of maintenance	Insulation	\$8.76		
Income Eligible Multifamily		requirements because of better quality heating, cooling and structural materials	Air Sealing	\$10.61	Annual	
Retrofit		Fewer colds and viruses, improved indoor air	Insulation	\$4.77		
Kellolit		quality and ease of maintaining healthy relative humidity as a result of weatherization in home	Air Sealing	\$5.69	Annual	
	Property Value Increase	Increased value of property and expected ease of	Insulation	\$223.63	Annual	
	rroperty value increase	selling home	Air Sealing	\$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
	Thermal Comfort	Greater participant-perceived comfort in home	Heating System Heating and Hot Water System	\$48.63 \$1.83	Annual
		Increased home durability in terms of	Heating System	\$17.42	
	Home Durability	maintenance requirements because of	Hot Water System	\$2.13	Annual
	,	better quality heating, cooling and structural materials	Heating and Hot Water System	\$0.72	
Residential Heating and		Reduced maintenance costs of owning	Heating System	\$102.40	
Hot Water	Equipment Maintenance	newer and/or more efficient appliance equipment	Heating and Hot Water System	\$3.41	Annual
	Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy	Heating System	\$1.56	Annual
	neattii belietits	relative humidity from weatherization	Heating and Hot Water System	\$0.06	Ailliuai
	Property Value Increase		Heating System	\$678.52	
		Increased value of property and expected ease of selling home	Hot Water System	\$82.56	One Time
		case of sering none	Heating and Hot Water System	\$29.17	
	Thermal Comfort	Greater participant-perceived comfort in home		\$25.00	Annual
	Noise Reduction	Less participant-perceived noise in the home		\$11.22	Annual
EnergyWise Single Family	Home Durability	Increased home durability from better quality heating, cooling and structural materials	N/A	\$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

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

Program	NEI	Description	Measure Category	Value	Duration
	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
			Insulation	\$25.38	
	Thermal Comfort	Greater participant-perceived comfort in home	Air Sealing	\$30.23	Annual
		Home	Heating System	\$28.01	
0' 1 -	Noise Reduction	Less participant-perceived noise in the	Insulation	\$13.56	Annual
Single Family -	Noise Reduction	home	Air Sealing	\$16.39	Aillidai
Income		Increased home durability in terms of	Insulation	\$8.76	
Eligible	Home Durability	maintenance requirements because of better quality heating, cooling and	Air Sealing	\$10.61	Annual
Services		structural materials	Heating System	\$9.72	
	Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	Heating System	\$27.43	Annual
		Fewer colds and viruses, improved indoor	Insulation	\$4.77	
	Health Benefits	air quality and ease of maintaining healthy	Air Sealing	\$5.69	Annual
		relative humidity as a result of weatherization in home	Heating System	\$5.27	
	Property Value	Increased value of property and expected	Insulation	\$223.63	
	Increase	ease of selling home	Air Sealing	\$144.93	One Time
		- Caco o. Coming 1.0.110	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		\$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	N/A	\$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
	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
EnergyWise Income			Air Sealing	\$10.61	
Eligible Multifamily			Heating System	\$9.72	
Retrofit	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	
		Increased value of property and expected ease of selling home	Insulation	\$223.63	
	Property Value Increase		Air Sealing	\$144.93	One Time
			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