Appendix D
Demand Side Management
2023 WA Draft IRP

Appendix Demand Side Management (DSM)

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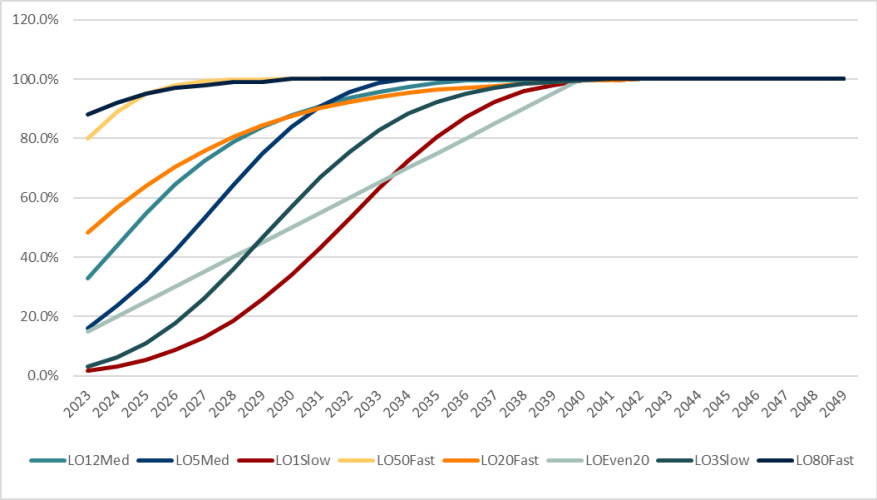
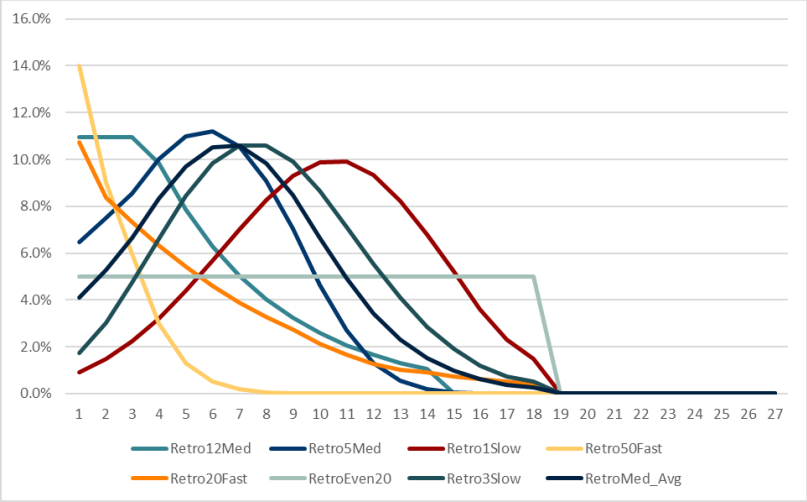
Key	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
LO12Med	32.8%	43.7%	54.7%	64.5%	72.4%	78.7%	83.7%	87.8%	91.0%	93.6%	95.6%	97.3%	98.6%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LO5Med	16.0%	23.5%	32.1%	42.1%	53.1%	64.3%	74.8%	83.9%	90.9%	95.8%	98.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LO1Slow	1.7%	3.2%	5.4%	8.6%	13.0%	18.7%	25.7%	34.0%	43.3%	53.1%	63.1%	72.4%	80.6%	87.3%	92.3%	96.0%	98.0%	99.6%	99.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LO50Fast	80.0%	89.0%	95.0%	97.9%	99.3%	99.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LO20Fast	48.4%	56.7%	64.0%	70.4%	75.8%	80.4%	84.3%	87.6%	90.3%	92.4%	94.1%	95.4%	96.4%	97.1%	97.7%	98.4%	98.9%	99.6%	99.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LOEven20	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%	45.0%	50.0%	55.0%	60.0%	65.0%	70.0%	75.0%	80.0%	85.0%	90.0%	95.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LO3Slow	3.2%	6.2%	10.9%	17.6%	26.0%	35.8%	46.4%	57.0%	66.9%	75.6%	82.7%	88.3%	92.3%	95.2%	97.1%	98.3%	99.1%	99.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LO80Fast	88.0%	92.0%	95.0%	97.0%	98.0%	99.0%	99.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Retro12Med	10.9%	10.9%	10.9%	9.8%	7.9%	6.3%	5.0%	4.0%	3.2%	2.6%	2.1%	1.7%	1.3%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retro5Med	6.5%	7.5%	8.6%	10.0%	11.0%	11.2%	10.6%	9.1%	7.0%	4.7%	2.7%	1.3%	0.6%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retro1Slow	0.9%	1.5%	2.2%	3.2%	4.4%	5.7%	7.0%	8.3%	9.3%	9.9%	9.9%	9.4%	8.2%	6.8%	5.2%	3.6%	2.3%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retro50Fast	14.0%	9.0%	6.0%	3.0%	1.3%	0.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retro20Fast	10.7%	8.4%	7.3%	6.3%	5.4%	4.6%	3.9%	3.3%	2.7%	2.1%	1.7%	1.3%	1.0%	0.9%	0.7%	0.6%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RetroEven20	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retro3Slow	1.7%	3.0%	4.7%	6.6%	8.4%	9.8%	10.6%	10.6%	9.9%	8.7%	7.1%	5.5%	4.1%	2.9%	1.9%	1.2%	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RetroMed_Avg	4.1%	5.3%	6.6%	8.3%	9.7%	10.5%	10.6%	9.8%	8.5%	6.7%	4.9%	3.4%	2.3%	1.5%	1.0%	0.6%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Ramp Rates from the NWPCC's 8th Plan





Residential DSM Highlights

Summary of Energy Savings (thousand therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,965	247,595	247,199	253,812	259,582	266,336	272,292
Cumulative Savings (thousand therms)							
Achievable Economic TRC Potential	125	255	424	1,784	3,285	4,270	4,416
Achievable Economic UCT Potential	584	723	1,246	5,183	9,526	12,153	12,290
Achievable Technical Potential	767	1,115	1,865	7,480	13,687	17,372	16,968
Technical Potential	3,303	4,846	7,404	21,146	32,873	40,339	42,598
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.1%	0.1%	0.2%	0.7%	1.3%	1.6%	1.6%
Achievable Economic UCT Potential	0.2%	0.3%	0.5%	2.0%	3.7%	4.6%	4.5%
Achievable Technical Potential	0.3%	0.5%	0.8%	2.9%	5.3%	6.5%	6.2%
Technical Potential	1.4%	2.0%	3.0%	8.3%	12.7%	15.1%	15.6%
Incremental Savings (thousand therms)							
Achievable Economic TRC Potential	128	144	176	339	285	194	6
Achievable Economic UCT Potential	596	466	548	970	889	667	103
Achievable Technical Potential	786	680	795	1,411	1,291	903	105
Technical Potential	3,383	2,654	2,722	3,061	2,161	1,862	373

Commercial DSM Forecast Highlights

Summary of Energy Savings (thousand therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,965	247,595	247,199	253,812	259,582	266,336	272,292
Cumulative Savings (thousand therms)							
Achievable Economic TRC Potential	363	836	1,441	6,453	11,253	14,155	15,144
Achievable Economic UCT Potential	378	873	1,492	6,497	11,294	14,426	15,585
Achievable Technical Potential	1,157	2,475	3,874	11,760	17,586	20,586	21,070
Technical Potential	2,338	4,661	6,943	18,372	25,225	28,582	29,740
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.1%	0.3%	0.6%	2.5%	4.3%	5.3%	5.6%
Achievable Economic UCT Potential	0.2%	0.4%	0.6%	2.6%	4.4%	5.4%	5.7%
Achievable Technical Potential	0.5%	1.0%	1.6%	4.6%	6.8%	7.7%	7.7%
Technical Potential	1.0%	1.9%	2.8%	7.2%	9.7%	10.7%	10.9%
Incremental Savings (thousand therms)							
Achievable Economic TRC Potential	361	466	624	1,264	1,142	1,040	1,295
Achievable Economic UCT Potential	377	485	638	1,241	1,153	1,068	1,204
Achievable Technical Potential	1,386	1,493	1,667	1,966	1,599	1,401	1,765
Technical Potential	2,332	2,280	2,425	2,550	2,011	1,777	2,384

Industrial DSM Forecast Highlights

Summary of Energy Savings (thousand therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,965	247,595	247,199	253,812	259,582	266,336	272,292
Cumulative Savings (thousand therms)							
Achievable Economic TRC Potential	94	204	321	927	1,326	1,534	1,518
Achievable Economic UCT Potential	81	168	256	697	1,082	1,322	1,333
Achievable Technical Potential	121	258	405	1,130	1,595	1,818	1,792
Technical Potential	158	334	515	1,391	1,927	2,172	2,155
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.0%	0.1%	0.1%	0.4%	0.5%	0.6%	0.6%
Achievable Economic UCT Potential	0.0%	0.1%	0.1%	0.3%	0.4%	0.5%	0.5%
Achievable Technical Potential	0.0%	0.1%	0.2%	0.4%	0.6%	0.7%	0.7%
Technical Potential	0.1%	0.1%	0.2%	0.5%	0.7%	0.8%	0.8%
Incremental Savings (thousand therms)							
Achievable Economic TRC Potential	95	110	121	123	86	68	60
Achievable Economic UCT Potential	81	87	89	93	83	71	63
Achievable Technical Potential	125	143	154	149	102	82	72
Technical Potential	160	179	187	176	119	97	86

Residential

Scenario B: RNG Future Avoided Costs

Summary of Energy Savings (therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,965	247,595	247,199	253,812	259,582	266,336	272,292
Cumulative Savings (therms)							
Achievable Economic TRC Potential	276	593	961	3,815	7,101	9,432	9,602
Achievable Economic UCT Potential	1,020	1,358	2,107	7,779	14,357	18,203	17,924
Achievable Technical Potential	1,104	1,534	2,380	8,725	16,029	20,283	19,760
Technical Potential	3,368	4,925	7,529	21,508	33,413	38,283	39,483
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.1%	0.2%	0.4%	1.5%	2.7%	3.5%	3.5%
Achievable Economic UCT Potential	0.4%	0.5%	0.9%	3.1%	5.5%	6.8%	6.6%
Achievable Technical Potential	0.5%	0.6%	1.0%	3.4%	6.2%	7.6%	7.3%
Technical Potential	1.4%	2.0%	3.0%	8.5%	12.9%	14.4%	14.5%
Incremental Savings (therms)							
Achievable Economic TRC Potential	284	326	389	723	671	496	33
Achievable Economic UCT Potential	1,043	672	797	1,433	1,345	962	155
Achievable Technical Potential	1,131	767	903	1,609	1,506	1,054	155
Technical Potential	3,450	2,703	2,773	3,115	2,206	1,243	374

Scenario C: RNG Future Avoided Costs Plus Municipal Gas Bans

Summary of Energy Savings (therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,814	247,281	246,725	252,549	257,553	263,559	268,795
Cumulative Savings (therms)							
Achievable Economic TRC Potential	122	245	407	1,692	3,085	3,981	4,074
Achievable Economic UCT Potential	1,399	1,526	2,051	6,018	10,439	13,167	13,138
Achievable Technical Potential	1,916	2,263	3,028	8,777	15,167	19,006	18,430
Technical Potential	8,859	10,416	13,020	26,999	38,904	46,497	48,789
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.1%	0.1%	0.2%	0.7%	1.2%	1.5%	1.5%
Achievable Economic UCT Potential	0.6%	0.6%	0.8%	2.4%	4.1%	5.0%	4.9%
Achievable Technical Potential	0.8%	0.9%	1.2%	3.5%	5.9%	7.2%	6.9%
Technical Potential	3.6%	4.2%	5.3%	10.7%	15.1%	17.6%	18.2%
Incremental Savings (therms)							
Achievable Economic TRC Potential	125	139	169	318	265	177	3
Achievable Economic UCT Potential	594	464	550	986	902	677	101
Achievable Technical Potential	794	689	811	1,455	1,326	925	103
Technical Potential	3,450	2,703	2,773	3,115	2,206	1,900	374

Commercial

Scenario B: RNG Future Avoided Costs

Summary of Energy Savings (therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,965	247,595	247,199	253,812	259,582	266,336	272,292
Cumulative Savings (therms)							
Achievable Economic TRC Potential	363	836	1,441	6,453	11,253	14,155	15,144
Achievable Economic UCT Potential	378	873	1,492	6,497	11,294	14,426	15,585
Achievable Technical Potential	1,157	2,475	3,874	11,760	17,586	20,586	21,070
Technical Potential	2,338	4,661	6,943	18,372	25,225	28,582	29,740
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.1%	0.3%	0.6%	2.5%	4.3%	5.3%	5.6%
Achievable Economic UCT Potential	0.2%	0.4%	0.6%	2.6%	4.4%	5.4%	5.7%
Achievable Technical Potential	0.5%	1.0%	1.6%	4.6%	6.8%	7.7%	7.7%
Technical Potential	1.0%	1.9%	2.8%	7.2%	9.7%	10.7%	10.9%
Incremental Savings (therms)							
Achievable Economic TRC Potential	361	466	624	1,264	1,142	1,040	1,295
Achievable Economic UCT Potential	377	485	638	1,241	1,153	1,068	1,204
Achievable Technical Potential	1,386	1,493	1,667	1,966	1,599	1,401	1,765
Technical Potential	2,332	2,280	2,425	2,550	2,011	1,777	2,384

Scenario C: RNG Future Avoided Costs Plus Municipal Gas Bans

Summary of Energy Savings (therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,814	247,281	246,725	252,549	257,553	263,559	268,795
Cumulative Savings (therms)							
Achievable Economic TRC Potential	359	828	1,426	6,435	11,156	13,959	14,879
Achievable Economic UCT Potential	872	1,365	1,982	6,945	11,656	14,691	15,784
Achievable Technical Potential	3,111	4,428	5,815	13,623	19,347	22,246	22,664
Technical Potential	6,819	9,107	11,353	22,603	29,305	32,525	33,551
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.1%	0.3%	0.6%	2.5%	4.3%	5.3%	5.5%
Achievable Economic UCT Potential	0.4%	0.6%	0.8%	2.7%	4.5%	5.6%	5.9%
Achievable Technical Potential	1.3%	1.8%	2.4%	5.4%	7.5%	8.4%	8.4%
Technical Potential	2.8%	3.7%	4.6%	9.0%	11.4%	12.3%	12.5%
Incremental Savings (therms)							
Achievable Economic TRC Potential	357	461	617	1,255	1,118	1,007	1,266
Achievable Economic UCT Potential	373	484	635	1,226	1,129	1,037	1,176
Achievable Technical Potential	1,375	1,478	1,649	1,939	1,564	1,358	1,714
Technical Potential	2,301	2,246	2,389	2,511	1,965	1,722	2,312

Industrial

Scenario B: RNG Future Avoided Costs

Summary of Energy Savings (therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,965	247,595	247,199	253,812	259,582	266,336	272,292
Cumulative Savings (therms)							
Achievable Economic TRC Potential	94	204	321	927	1,326	1,534	1,518
Achievable Economic UCT Potential	81	168	256	697	1,082	1,322	1,333
Achievable Technical Potential	121	258	405	1,130	1,595	1,818	1,792
Technical Potential	158	334	515	1,391	1,927	2,172	2,155
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.0%	0.1%	0.1%	0.4%	0.5%	0.6%	0.6%
Achievable Economic UCT Potential	0.0%	0.1%	0.1%	0.3%	0.4%	0.5%	0.5%
Achievable Technical Potential	0.0%	0.1%	0.2%	0.4%	0.6%	0.7%	0.7%
Technical Potential	0.1%	0.1%	0.2%	0.5%	0.7%	0.8%	0.8%
Incremental Savings (therms)							
Achievable Economic TRC Potential	95	110	121	123	86	68	60
Achievable Economic UCT Potential	81	87	89	93	83	71	63
Achievable Technical Potential	125	143	154	149	102	82	72
Technical Potential	160	179	187	176	119	97	86

Scenario C: RNG Future Avoided Costs Plus Municipal Gas Bans

Summary of Energy Savings (therms), Selected Years	2023	2024	2025	2030	2035	2040	2045
Reference Baseline	243,814	247,281	246,725	252,549	257,553	263,559	268,795
Cumulative Savings (therms)							
Achievable Economic TRC Potential	94	204	321	927	1,326	1,536	1,525
Achievable Economic UCT Potential	232	318	406	848	1,232	1,475	1,491
Achievable Technical Potential	322	460	606	1,332	1,797	2,021	2,000
Technical Potential	418	595	775	1,651	2,187	2,432	2,416
Energy Savings (% of Baseline)							
Achievable Economic TRC Potential	0.0%	0.1%	0.1%	0.4%	0.5%	0.6%	0.6%
Achievable Economic UCT Potential	0.1%	0.1%	0.2%	0.3%	0.5%	0.6%	0.6%
Achievable Technical Potential	0.1%	0.2%	0.2%	0.5%	0.7%	0.8%	0.7%
Technical Potential	0.2%	0.2%	0.3%	0.7%	0.8%	0.9%	0.9%
Incremental Savings (therms)							
Achievable Economic TRC Potential	95	110	121	123	86	69	60
Achievable Economic UCT Potential	81	87	89	93	83	72	63
Achievable Technical Potential	125	143	154	149	102	82	72
Technical Potential	160	179	187	176	119	97	86

| | Measure | | | | | | | | | | | | 2023 Measure Information [Unitized] | | | | | | | | | | | |

| Measures | | |

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Regular	Residential	C25 - Multi Family	Existing	Water Heating	Natural Gas	ENERGY STAR Homes	A	RR6089	NG Building Code	Built Green-spec (NC Only)	70	0.00	0.00	0.00	$1.28	$0.00	$0.00	$0.00	$0.00	household	0.0%	0.0% Retrofit	LIDWest	86.3% 780	0.2%	$43.99	$3.00	0.0	BetaNRStandardNonNC2012	N/A	N/A
Regular	Residential	C25 - Multi Family	Existing	Water Heating	Natural Gas	Built Green homes	A	RR6080	NG Building Code	Built Green-spec (NC Only)	70	0.00	0.00	0.00	$1.28	$0.00	$0.00	$0.00	$0.00	household	0.0%	0.0% Retrofit	LIDUNited	86.7% 780	0.2%	$43.99	$3.00	0.0	BetaNRStandardNonNC2012	N/A	N/A
Regular	Residential	C25 - Multi Family	Existing	Water Heating	Natural Gas	Built Green homes	A	RR6081	NG Building Code	Built Green-spec (NC Only)	70	0.00	0.00	0.00	$1.28	$0.00	$0.00	$0.00	$0.00	household	0.0%	0.0% Retrofit	LIDUNited	86.7% 780	0.2%	$43.99	$3.00	0.0	BetaNRStandardNonNC2012	N/A	N/A
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Combined Boiler > DHW System (Storage Tank)	A	RR6083	Gas space heating AFUE 80% and water heating baseline storage tank 40 gal	Combined tankless boiler unit for space and DHW	21	43.94	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	1.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$2,927.32	$833.13	0.0	CNGC Program Data	CNGC Program Data	Calculated
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Combined Boiler > DHW System (Storage Tank)	A	RR6085	Gas space heating AFUE 80% and water heating baseline storage tank 40 gal	Combined tankless boiler unit for space and DHW	21	57.50	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	1.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$2,927.32	$833.13	0.0	CNGC Program Data	CNGC Program Data	Calculated
Regular	Residential	C25 - Multi Family	Existing	Water Heating	Natural Gas	Combined Boiler > DHW System (Tankless)	A	RR6084	Gas space heating AFUE 80% and separate water heating tankless unit	Combined tankless boiler unit for space and DHW	21	43.94	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	1.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$2,927.32	$833.13	0.0	CNGC Program Data	CNGC 2018 CDNRD Data	Calculated
Regular	Residential	C25 - Multi Family	Existing	Water Heating	Natural Gas	Combined Boiler > DHW System (Tankless)	A	RR6085	Gas space heating AFUE 80% and separate water heating tankless unit	Combined tankless boiler unit for space and DHW	21	57.50	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	1.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$2,927.32	$833.13	0.0	CNGC Program Data	CNGC 2018 CDNRD Data	Calculated
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Ceiling - Installation	A	RR6090	N/A	R-30 (Retro only)	45	0.00	0.00	0.00	$1.09	$0.00	$0.00	$0.00	$1.00	wall roof - rel	0.0%	0.0% Retrofit	JAS_Retrofits_Linear	0.0% 780	0.3%	$103.51	$76.61	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA	N/A	
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Ceiling - up to R40	A	RR6088	R11 - up to R40	R-30 (NC Only)	70	0.00	0.00	0.00	$1.09	$0.00	$0.00	$0.00	$1.00	wall roof - rel	0.0%	0.0% Retrofit	JAS_Retrofits_Linear	0.0% 780	0.3%	$103.51	$76.61	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA	N/A	
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Slab Perimeter	A	RR6086	R-10	R-10 (NC Only)	70	0.00	0.00	0.00	$1.82	$0.00	$0.00	$0.00	$0.00	wall floor	0.0%	0.0% Retrofit	RetrofitLinear	86.7% 780	0.2%	$14.98	$0.00	0.0	BetaNewBuildingInsulation - NonNewBuildingInsulation	N/A	
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Basement Sidewall	A	RR6089	R-10	R-10	70	0.00	0.00	0.00	$1.00	$0.00	$0.00	$0.00	$0.00	wall floor	0.0%	0.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$14.98	$0.00	0.0	BetaNewBuildingInsulation - NonNewBuildingInsulation	N/A	
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Decking	A	RR6060	1st Floor	duct thermal losses reduced 50%	45	0.09	0.00	0.00	$2.46	$0.01	$0.00	$0.00	$0.00	heat duct R	10.0%	10.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$129.08	$32.77	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Infiltration Control (Air Sealing)	A	RR6061	ACH50 <= 5	35% reduction in ACH50	55	0.01	0.00	0.00	$0.71	$0.00	$0.00	$0.00	$0.08	wall frame	85.0%	84.5% Retrofit	RetrofitLinear	86.8% 780	0.2%	$140.12	$16.54	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA RTF Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Building Shell - Whole Home Air Vapor Retarder Barrier	A	RR6062	ACH50 <= 5	35% reduction in ACH50	55	0.01	0.00	0.00	$0.71	$0.00	$0.00	$0.00	$0.08	wall frame	0.0%	0.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$140.12	$16.54	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA RTF Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Building Shell - Whole Home Aerosol Sealing	A	RR6063	ACH50 <= 5	35% reduction in ACH50	20	0.01	0.00	0.00	$0.51	$0.00	$0.00	$0.00	$0.10	wall frame	0.0%	0.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$111.87	$30.77	0.0	BPA TRM v1.1 - MultiMeasure DHS TRM v4.1 - MultiMeasure Energy Power Company		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Floors/Crawlspace	A	RR6064	R-30	R-30	45	0.01	0.00	0.00	$1.42	$0.00	$0.00	$0.00	$0.75	wall floor	72.0%	67.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$127.51	$49.61	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA RTF Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Wall Cavity, Upgrade	A	RR6065	R-21 - up to R-30	R-21	45	0.00	0.00	0.00	$3.22	$0.00	$0.00	$0.00	$0.75	wall wall	100.0%	95.7% Retrofit	JAS_Retrofits_Linear	0.0% 780	0.2%	$65.35	$19.52	0.0	NWPCC 7th Plan Res MH NEEA National Residential MEC7		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Wall Cavity, Installation	A	RR6066	R-21	R-21	45	0.00	0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	wall wall	0.0%	0.0% Retrofit	JAS_Retrofits_Linear	0.0% 780	0.2%	$75.91	$30.23	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA RTF Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - Wall Cavity, Upgrade	A	RR6067	R-21 - up to R-30	R-21 (NC Only)	70	0.00	0.00	0.00	$3.22	$0.00	$0.00	$0.00	$0.75	wall wall	100.0%	95.7% Retrofit	RetrofitLinear	86.7% 780	0.2%	$65.35	$19.52	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA RTF Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Insulation - External Wall Sheathing - Insulated Vinyl Siding	A	RR6068	R-5	R-5 (NC Only)	25	0.01	0.00	0.00	$2.60	$0.00	$0.00	$0.00	$0.73	wall frame	0.0%	0.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$383.71	$56.80	0.0	BPA_WS_DEMND-PNW2_CPE1_WS_DEMND-PNW2_CPE1_WS_DEMND-PNW2_C		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Sealing - Repair and Sealing	A	RR6069	10% air leak to outside	10% reduction in duct leakage	20	22.60	0.00	0.00	$793.95	$3.37	$0.00	$0.00	$150.00	household	0.0%	0.0% Retrofit	RetrofitLinear	86.2% 780	0.2%	$2,780.81	$720.73	0.0	RTF Worksheet - ResRDSu CNGC 2019 Program Rep RTF Worksheet - ResDSu		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Sealing - Repair and Sealing - Aerosol	A	RR6070	10% air leak to outside	10% reduction in duct leakage	10	0.02	0.00	0.00	$8.64	$0.00	$0.00	$0.12	$2.12	wall frame	0.0%	0.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$165.55	$79.64	0.0	RCT_PPL_DERS-PNW2-ECT_PPL_DERS-PNW2-ECT_PPL_DERS-PNW2-EC		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Doors - Storm and Thermal	A	RR6072	R-2.5 door	R-5 door	45	0.13	0.00	0.00	$19.53	$0.02	$0.00	$0.00	$2.38	wall door	60.0%	100.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$115.49	$88.54	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Windows - U-.30 or better	A	RR6073	Existing Inefficient Window	Double Pane Low-E U30	45	0.19	0.00	0.00	$28.96	$0.03	$0.00	$0.00	$2.35	wall window	44.0%	46.1% Retrofit	RetrofitLinear	86.2% 780	0.2%	$311.27	$78.65	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Windows - U-.22 or better	A	RR6074	Existing Inefficient Window	Double Pane Low-E U22	45	0.19	0.00	0.00	$28.96	$0.03	$0.00	$0.00	$2.35	wall window	44.0%	46.1% Retrofit	RetrofitLinear	86.2% 780	0.2%	$311.27	$78.65	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Windows - Low-e Storm Addition	A	RR6075	Existing Inefficient Window	Existing Inefficient Window	20	0.02	0.00	0.00	$10.89	$0.00	$0.00	$0.00	$2.16	windows	0.0%	0.0% Retrofit	RetrofitLinear	86.2% 780	0.2%	$411.01	$133.33	0.0	RTF Worksheet - ResNRNEW Worksheet - ResNRNA		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	ENERGY STAR Qualified Boiler	A	RR6076	95 AFUE	95 AFUE	70	0.00	0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	household	0.0%	0.0% Retrofit	RetrofitLinear	86.7% 780	0.2%	$0.00	$0.00	0.0	RTF Worksheet - ResGenCNGC Program Data	RTF Worksheet - ResGen	
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	ENERGY STAR Connected Thermostat	A	RR6078	Manual/no control	Enhanced Performance Thermostat (vs. NEST)	5	0.32	0.00	0.00	$266.22	$1.49	$0.00	$0.00	$215.00	household	5.0%	70.0% Retrofit	JAS_Retrofits_Linear	0.0% 780	0.2%	$1,015.17	$358.38	0.0	RTF Worksheet - ResGenCNGC Program Data	RTF Worksheet - ResGen	
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Gas Furnace - Maintenance	A	RR6077	Degraded efficiency 10% below nameplate	Restored to nameplate 80% AFUE	2	0.00	0.00	0.00	$154.16	$0.00	$0.00	$0.00	$0.00	household	0.0%	0.0% Retrofit	RetrofitLinear20	86.8% 780	0.2%	$421.62	$0.00	0.0	AR TRM - Furnace Tune-Up TRM - Furnace Tune-Up N/A		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Gas Boiler - Hot Water Reset	A	RR6078	No reset controls	Reset control installed	56	7.47	0.00	0.00	$656.21	$0.00	$0.00	$0.00	$32.71	household	10.0%	100.0% Retrofit	RetrofitLinear	81.7% 780	0.2%	$160.07	$7.86	0.0	TRM - 1.5.10 - RS HVC 1.TRM - 1.5.10 - RS HVC 1.TRM - 1.5.10 - RS HVC		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Gas Boiler - Steam Trap Maintenance	A	RR6079	Degraded system	Cleaned and restored	8	0.00	0.00	0.00	$77.00	$0.00	$0.00	$0.00	$0.00	household	0.0%	0.0% Retrofit	RetrofitLinear20	86.8% 780	0.2%	$151.68	$0.00	0.0	TRM - 4.4.16 - CI-HVC1 V1.TRM - 4.4.16 - CI-HVC1 N/A		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Gas Boiler - Boiler Tune-Up	A	RR6080	Degraded efficiency 10% below nameplate	Restored to nameplate 80% AFUE	2	0.00	0.00	0.00	$154.16	$0.00	$0.00	$0.00	$0.00	household	0.0%	0.0% Retrofit	RetrofitLinear20	86.8% 780	0.2%	$421.62	$0.00	0.0	AR TRM - Boiler Tune-Up TRM - Boiler Tune-Up N/A		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Gas Boiler - Pipe Insulation	A	RR6081	No insulation	Pipe insulated throughout home	15	0.00	0.00	0.00	$2.95	$0.00	$0.00	$0.00	$0.96	heat pipe	10.0%	100.0% Retrofit	RetrofitLinear	75.4% 780	0.2%	$14.04	$12.81	0.0	TRM - 5.3.2 - RS HVC 4.TRM - 5.3.2 - RS HVC 4.TRM - 5.3.2 - RS HVC 4		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Water Heater - Drainwater Heat Recovery	A	RR6082	None	Drain equipped with heat recovery system	50	42.91	0.00	0.00	$781.56	$0.00	$0.00	$0.00	$78.19	household	0.0%	10.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$1,030.69	$149.85	0.0	NWPCC 2021 Power Plan NWPCC 2021 Power Plan NWPCC 2021 Power Plan		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Thermostatic Radiator Valve	A	RR6083	Radiator with no Thermostatic Restriction Value	Thermostatic Restriction Value	25	3.93	0.00	0.00	$66.87	$0.00	$0.00	$0.00	$64.87	radiator	0.0%	5.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$313.72	$165.15	0.0	TRM - 5.5.19 - RS HVC 1.RS CNGC Gas Characterization 5.TRM - 5.5.19 - RS HVC		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Water Heater - Low Flow Showerhead (2.0 GPM)	A	RR6084	2.5 GPM showerhead	2.0 GPM showerhead	10	6.44	0.00	0.00	$18.08	$8.96	$0.00	$0.00	$19.09	showerheads	0.0%	0.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$1,142.89	$485.82	0.0	RTF - Showerheads_v5.1 RTF - Showerheads_v5.1 RTF - Showerheads_v5.1		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Water Heater - Low Flow Showerhead (1.5 GPM)	A	RR6085	2.5 GPM showerhead	1.5 GPM showerhead	10	9.66	0.00	0.00	$27.12	$13.44	$0.00	$0.00	$28.63	showerheads	0.0%	0.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$1,714.33	$728.73	0.0	RTF - Showerheads_v5.1 RTF - Showerheads_v5.1 RTF - Showerheads_v5.1		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Water Heater - Temperature Setback	A	RR6086	140 F set point	Setback to 120 F	2	4.10	0.00	0.00	$4.91	$0.00	$0.00	$0.00	$4.95	household	10.0%	100.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$67.17	$1,008.85	0.0	TRM - 5.6.5 - RS HVAC 5.TRM - 5.6.5 - RS HVAC 5.TRM - 5.6.5 - RS HVAC		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Water Heater - Thermostatic Shower Restriction Valve	A	RR6087	No control	Restrictor installed, shutting off water when it is warm	10	2.05	0.00	0.00	$24.68	$4.36	$0.00	$0.00	$23.20	showerheads	0.0%	100.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$1,166.70	$1,197.18	0.0	RTF Worksheet - ThermostRF Worksheet - ThermostRF Worksheet - ThermostRF		
Regular	Residential	C25 - Multi Family	New	Water Heater	Natural Gas	Water Heater - Pipe Insulation	A	RR6088	No insulation of water pipe in unconditioned space	Insulated 5' of pipe between unit and conditioned space	25	0.81	0.00	0.00	$3.91	$0.00	$0.00	$0.00	$2.89	heat pipe	10.0%	100.0% Retrofit	RetrofitLinear	86.8% 780	0.2%	$313.58	$156.05	0.0	TRM - 5.4.1 - RS HWR 5.TRM - 5.4.1 - RS HWR 5.TRM - 5.4.1 - RS HWR		
Regular	Residential	C25 - Multi Family	New	Water Heater	Natural Gas	Water Heater - Solar System	A	RR6089	Standard tank water heater, baseline	40 sq ft supplemental solar system installed	30	19.66	0.00	0.00	$7,206.96	$0.00	$25.37	$0.00	$576.67	household	2.0%	30.0% Retrofit	RetrofitLinear	59.9% 780	0.2%	$6,378.52	$805.17	0.0	SGI 2018 Tech Forecast - SGI 2018 Tech Forecast - Michigan Energy Measure		
Regular	Residential	C25 - Multi Family	New	Water Heater	Natural Gas	Water Heater - Tankless Water Heater	A	RR6090	Standard tank water heater	Tankless water heater installed	20	0.00	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	0.0%	0.0% Retrofit	LIDUNited	86.7% 780	0.2%	$2,927.32	$833.13	0.0	CNGC Program Data	CNGC Program Data	Calculated
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	ENERGY STAR Dishwashers	A	RR6091	Minimum standard unit	ENERGY STAR unit	11	2.89	0.00	0.00	$77.77	$0.42	$0.00	$0.00	$23.93	household	67.9%	78.0% Lost Opportunity	RetrofitLinear20	80.8% 780	0.2%	$1,116.95	$1,450.75	0.0	TRM - 5.1.6 - RS LAN 4.TRM - 5.1.6 - RS LAN 4.TRM - 5.1.6 - RS LAN 4		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	ENERGY STAR Clothes Washers	A	RR6092	Minimum standard unit	ENERGY STAR unit	14.2	7.73	0.00	0.00	$61.41	$19.84	$0.00	$0.00	$58.84	household	19.5%	47.0% Lost Opportunity	RetrofitLinear20	80.8% 780	0.2%	$2,939.13	$162.17	0.0	RTF Worksheet - ResClothWRNEW Worksheet - ResClothWRNEW Worksheet - ResClothW		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	ENERGY STAR Homes	A	RR6093	NG Building Code	Built Green-spec (NC Only)	70	0.00	0.00	0.00	$1,077.27	$0.00	$0.00	$0.00	$150.00	household	0.0%	0.0% Retrofit	LIDUNited	86.7% 780	0.2%	$1,662.21	$168.14	0.0	BetaNRStandardNonNC2012 - Cost & Savings Estimates CNGC Guidance		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	ENERGY STAR Homes	A	RR6094	NG Building Code	Built Green-spec (NC Only)	70	18.68	0.00	0.00	$1,077.27	$0.00	$0.00	$0.00	$53.88	household	0.0%	0.0% Retrofit	LIDUNited	86.7% 780	0.2%	$1,662.21	$168.14	0.0	BetaNRStandardNonNC2012 - Cost & Savings Estimates CNGC Guidance		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Built Green homes	A	RR6095	NG Building Code	Built Green-spec (NC Only)	70	11.36	0.00	0.00	$1,077.27	$0.00	$0.00	$0.00	$150.00	household	0.0%	0.0% Retrofit	LIDUNited	86.7% 780	0.2%	$2,666.15	$642.68	0.0	BetaNRStandardNonNC2012 - Cost & Savings Estimates CNGC Guidance rev. 5/1		
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Built Green homes	A	RR6096	NG Building Code	Built Green-spec (NC Only)	70	9.11	0.00	0.00	$1,077.27	$0.00	$0.00	$0.00	$150.00	household	0.0%	0.0% Retrofit	LIDUNited	86.7% 780	0.2%	$2,666.15	$642.68	0.0	BetaNRStandardNonNC2012 - Cost & Savings Estimates CNGC Guidance rev. 5/1		
Regular	Residential	C25 - Multi Family	New	Space Heating	Natural Gas	Combined Boiler > DHW System (Storage Tank)	A	RR6097	Gas space heating AFUE 80% and water heating baseline storage tank 40 gal	Combined tankless boiler unit for space and DHW	21	43.94	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	0.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$9,680.88	$1,658.28	0.0	CNGC Program Data	CNGC Program Data	Calculated
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Combined Boiler > DHW System (Storage Tank)	A	RR6098	Gas space heating AFUE 80% and water heating baseline storage tank 40 gal	Combined tankless boiler unit for space and DHW	21	57.50	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	0.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$9,680.88	$1,658.28	0.0	CNGC Program Data	CNGC 2018 CDNRD Data	Calculated
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Combined Boiler > DHW System (Tankless)	A	RR6099	Gas space heating AFUE 80% and separate water heating tankless unit	Combined tankless boiler unit for space and DHW	21	43.94	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	0.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$9,680.88	$1,658.28	0.0	CNGC Program Data	CNGC 2018 CDNRD Data	Calculated
Regular	Residential	C25 - Multi Family	New	Water Heating	Natural Gas	Combined Boiler > DHW System (Tankless)	A	RR6100	Gas space heating AFUE 80% and separate water heating tankless unit	Combined tankless boiler unit for space and DHW	21	57.50	0.00	0.00	$1,186.57	$0.00	$0.00	$0.00	$600.00	household	0.0%	50.0% Lost Opportunity	LIDUPast	86.7% 780	0.2%	$9,680.88	$1,658.28	0.0	CNGC Program Data	CNGC 2018 CDNRD Data	Calculated

| Measure | | |

WA	Commercial	Warehouse	New	Food Preparation	Natural Gas	Range	A	C0221	Standard	High-Efficiency	10	285.56	0.00	0.00	0.00	$1.03	$0.00	$0.00	$0.00	$1.03	$1.13	1 unit	1.6%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$2.15	$2.76	0.01	COOK_OVN-Food Prepar	EIA 2018 Tech Forecast	EIA 2018 Tech Forecast
WA	Commercial	Warehouse	New	Food Preparation	Natural Gas	Steamer	A	C0222	Standard	ENERGY STAR	12	0.00	0.00	0.00	0.00	$1,107.01	$2.92	$0.00	$0.00	$943.10	$1,037.41	1 unit	0.0%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$279.59	$321.60	0.01	TRM - 4.2.3 - CI-FSE-ST-1	TRM - 4.2.3 - CI-FSE-ST-1	TRM - 4.2.3 - CI-FSE-ST-1
WA	Commercial	Warehouse	New	Food Preparation	Natural Gas	Food Prep-Other	A	C0223	Standard	ENERGY STAR	10	0.00	0.00	0.00	0.00	$1.15	$0.00	$0.00	$0.00	$0.03	$0.04	1 unit	0.0%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$160.04	$8.40	0.0	N/A	N/A	N/A
WA	Commercial	Warehouse	New	Miscellaneous	Natural Gas	Pool Heater	A	C0224	Standard (EF .78)	Condensing (EF .90)	6	0.00	0.00	0.00	0.00	$12,298.09	$0.00	$0.00	$0.00	$6,836.78	$7,900.46	1 unit	0.0%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$372.28	$203.06	0.0	DOE Commercial R&D 2	DOE Commercial R&D 2	DOE Commercial R&D 2
WA	Commercial	Miscellaneous	Existing	Space Heating	Natural Gas	Furnace	A	C0225	AFUE 80% (Standard)	AFUE 96%	23	188.62	0.00	0.00	0.00	$1,826.85	-$10.15	$0.00	$0.00	$368.32	$605.15	400 kBtu/hr	76.1%	55.0% Turnover	UGWeat	66.4% TRD	0.2%	$647.07	$216.12	0.0	EIA 2018 Tech Forecast	EIA 2018 Tech Forecast	AEO 8/07
WA	Commercial	Miscellaneous	Existing	Space Heating	Natural Gas	Boiler	A	C0226	AFUE 80% (Standard)	AFUE 97%	25	1,596.21	0.00	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$14,751.68	$15,135.85	800 kBtu/hr	56.1%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$1,155.86	$965.55	0.0	EIA 2018 Tech Forecast	EIA 2018 Tech Forecast	DBJR Existing 01/14-20
WA	Commercial	Miscellaneous	Existing	Space Heating	Natural Gas	Unit Heater	A	C0227	Standard	Infrared Radiant	15	41,304.07	0.00	0.00	0.00	$81,063.63	$5,987.78	$0.00	$0.00	$25,458.01	$27,368.81	125 kBtu/hr	35.8%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$285.68	$330.56	0.0	TRM - 4.4.12 - CI-HVC-V	NEEC Program Date	6. TRM - 4.4.12 - CI-HVC-
WA	Commercial	Miscellaneous	New	Water Heating	Natural Gas	Water Heater	A	C0228	TE 88%	TE 96%	10	3.19	0.00	0.00	0.00	$0.93	$0.15	$0.00	$0.00	$0.40	$0.44	1 kBtu/hr	85.8%	100.0% Turnover	UGWeat	66.7% TRD	0.2%	$121.93	$65.60	0.7	GAS 2021 - gas_water_h	NEEC 2021 - gas_water_h	NEEC 2021 - gas_water_h
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Oven	A	C0229	Standard	ENERGY STAR (>50% Baking Efficiency)	12	243.38	0.00	0.00	0.00	$56.63	$0.00	$0.00	$0.00	$54.41	$59.85	1 unit	0.0%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$37.94	$69.51	0.0	TRM - 4.2.1 - CI-FSE-OB	EIA 2018 Tech Forecast	6. TRM - 4.2.1 - CI-FSE-OB
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Convayor Oven	A	C0230	Standard	Efficient (>45% Baking Efficiency)	17	692.28	0.00	0.00	0.00	$1,564.63	$0.00	$0.00	$0.00	$605.02	$665.52	1 unit	1.5%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$514.95	$117.18	0.0	TRM - 4.2.4 - CI-FSE-CV	PGECOFAR: TRM 5.1 - Gas	Conve
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Double Rack Oven	A	C0231	Standard	FTSC Qualified (>60% Cooking Efficiency)	12	1,857.57	0.00	0.00	0.00	$6,287.63	$0.00	$0.00	$0.00	$1,252.06	$1,377.27	1 unit	1.5%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$262.73	$133.68	0.0	TRM - 4.2.18 - CI-FSE-RP	Workpaper_PGECOFAR:	TRM - 4.2.18 - CI-FSE-R
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Fryer	A	C0232	Standard	ENERGY STAR	5.5	417.20	0.00	0.00	0.00	$902.15	$0.00	$0.00	$0.00	$543.84	$620.23	1 unit	4.8%	100.0% Turnover	UG1Weat	81.7% TRD	0.2%	$383.52	$521.00	0.03	RTF WMA - ComCooking	RTF WMA - ComCooking	RTF WMA - ComCooking
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Broiler	A	C0233	Standard	Infrared Burners	12	228.68	0.00	0.00	0.00	$1,129.59	$0.00	$0.00	$0.00	$793.52	$815.58	1 unit	3.6%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$686.06	$660.43	0.0	TRM - 4.2.16 - CI-FSE-RB	TRM - 4.2.16 - CI-FSE-RB	TRM - 4.2.16 - CI-FSE-RB
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Griddle	A	C0234	Standard	ENERGY STAR	12	199.86	0.00	0.00	0.00	$391.72	$0.00	$0.00	$0.00	$391.72	$430.90	1 unit	4.2%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$398.85	$478.44	0.0	TRM - 4.2.8 - CI-FSE-GS	COOK_ORD-Food Prepar	TRM - 4.2.8 - CI-FSE-GS
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Range	A	C0235	Standard	High-Efficiency	10	285.56	0.00	0.00	0.00	$1.03	$0.00	$0.00	$0.00	$1.03	$1.13	1 unit	16.1%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$2.15	$2.76	0.01	COOK_OVN-Food Prepar	EIA 2018 Tech Forecast	EIA 2018 Tech Forecast
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Steamer	A	C0236	Standard	ENERGY STAR	12	1,150.32	0.00	0.00	0.00	$1,107.01	$2.92	$0.00	$0.00	$943.10	$1,037.41	1 unit	1.3%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$169.96	$162.22	0.01	TRM - 4.2.3 - CI-FSE-ST-1	TRM - 4.2.3 - CI-FSE-ST-1	TRM - 4.2.3 - CI-FSE-ST-1
WA	Commercial	Miscellaneous	Existing	Food Preparation	Natural Gas	Food Prep-Other	A	C0237	Standard	ENERGY STAR	10	0.01	0.00	0.00	0.00	$1.15	$0.00	$0.00	$0.00	$0.03	$0.04	1 unit	1.3%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$102.71	$12.29	0.0	N/A	N/A	N/A
WA	Commercial	Miscellaneous	Existing	Miscellaneous	Natural Gas	Pool Heater	A	C0238	Standard (EF .78)	Condensing (EF .90)	6	1,138.84	0.00	0.00	0.00	$12,298.09	$0.00	$0.00	$0.00	$6,836.78	$7,900.46	1 unit	7.0%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$1,361.05	$1,206.67	0.0	DOE Commercial R&D 2	DOE Commercial R&D 2	DOE Commercial R&D 2
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Furnace	A	C0239	AFUE 80% (Standard)	AFUE 96%	23	188.62	0.00	0.00	0.00	$1,826.85	-$10.15	$0.00	$0.00	$368.32	$605.15	400 kBtu/hr	76.1%	55.0% Turnover	UG1Weat	66.4% TRD	0.2%	$647.00	$216.09	1.0	EIA 2018 Tech Forecast	EIA 2018 Tech Forecast	AEO 8/07
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Boiler	A	C0240	AFUE 80% (Standard)	AFUE 97%	25	1,596.21	0.00	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$14,751.68	$15,135.85	800 kBtu/hr	56.1%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$1,155.86	$965.55	0.0	EIA 2018 Tech Forecast	EIA 2018 Tech Forecast	DBJR Existing 01/14-20
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Unit Heater	A	C0241	Standard	Infrared Radiant	15	41,304.07	0.00	0.00	0.00	$81,063.63	$5,987.78	$0.00	$0.00	$25,458.01	$27,368.81	125 kBtu/hr	35.8%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$285.68	$330.56	0.0	TRM - 4.4.12 - CI-HVC-V	NEEC Program Date	6. TRM - 4.4.12 - CI-HVC-
WA	Commercial	Miscellaneous	New	Water Heating	Natural Gas	Water Heater	A	C0242	TE 88%	TE 96%	10	3.19	0.00	0.00	0.00	$0.93	$0.15	$0.00	$0.00	$0.40	$0.44	1 kBtu/hr	85.8%	100.0% Turnover	UG1Weat	66.7% TRD	0.2%	$121.93	$65.60	0.7	GAS 2021 - gas_water_h	NEEC 2021 - gas_water_h	NEEC 2021 - gas_water_h
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Oven	A	C0243	Standard	ENERGY STAR (>50% Baking Efficiency)	12	243.38	0.00	0.00	0.00	$56.63	$0.00	$0.00	$0.00	$54.41	$59.85	1 unit	0.0%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$37.94	$69.51	0.0	TRM - 4.2.1 - CI-FSE-OB	EIA 2018 Tech Forecast	6. TRM - 4.2.1 - CI-FSE-OB
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Convayor Oven	A	C0244	Standard	Efficient (>45% Baking Efficiency)	17	658.75	0.00	0.00	0.00	$1,564.63	$0.00	$0.00	$0.00	$605.02	$665.52	1 unit	1.5%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$514.95	$117.18	0.0	TRM - 4.2.4 - CI-FSE-CV	PGECOFAR: TRM 5.1 - Gas	Conve
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Double Rack Oven	A	C0245	Standard	FTSC Qualified (>60% Cooking Efficiency)	12	1,857.57	0.00	0.00	0.00	$6,287.63	$0.00	$0.00	$0.00	$1,252.06	$1,377.27	1 unit	1.5%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$262.73	$133.68	0.0	TRM - 4.2.18 - CI-FSE-RP	Workpaper_PGECOFAR:	TRM - 4.2.18 - CI-FSE-R
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Fryer	A	C0246	Standard	ENERGY STAR	5.5	417.20	0.00	0.00	0.00	$902.15	$0.00	$0.00	$0.00	$543.84	$620.23	1 unit	4.8%	100.0% Turnover	UG1Weat	81.7% TRD	0.2%	$383.52	$521.00	0.03	RTF WMA - ComCooking	RTF WMA - ComCooking	RTF WMA - ComCooking
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Broiler	A	C0247	Standard	Infrared Burners	12	228.68	0.00	0.00	0.00	$1,129.59	$0.00	$0.00	$0.00	$793.52	$815.58	1 unit	3.6%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$686.06	$660.43	0.0	TRM - 4.2.16 - CI-FSE-RB	TRM - 4.2.16 - CI-FSE-RB	TRM - 4.2.16 - CI-FSE-RB
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Griddle	A	C0248	Standard	ENERGY STAR	12	199.86	0.00	0.00	0.00	$391.72	$0.00	$0.00	$0.00	$391.72	$430.90	1 unit	4.2%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$398.85	$478.44	0.0	TRM - 4.2.8 - CI-FSE-GS	COOK_ORD-Food Prepar	TRM - 4.2.8 - CI-FSE-GS
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Range	A	C0249	Standard	High-Efficiency	10	285.56	0.00	0.00	0.00	$1.03	$0.00	$0.00	$0.00	$1.03	$1.13	1 unit	16.1%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$2.15	$2.76	0.01	COOK_OVN-Food Prepar	EIA 2018 Tech Forecast	EIA 2018 Tech Forecast
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Steamer	A	C0250	Standard	ENERGY STAR	12	1,150.32	0.00	0.00	0.00	$1,107.01	$2.92	$0.00	$0.00	$943.10	$1,037.41	1 unit	1.3%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$169.96	$162.22	0.01	TRM - 4.2.3 - CI-FSE-ST-1	TRM - 4.2.3 - CI-FSE-ST-1	TRM - 4.2.3 - CI-FSE-ST-1
WA	Commercial	Miscellaneous	New	Food Preparation	Natural Gas	Food Prep-Other	A	C0251	Standard	ENERGY STAR	10	0.01	0.00	0.00	0.00	$1.15	$0.00	$0.00	$0.00	$0.03	$0.04	1 unit	1.3%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$102.71	$12.29	0.0	N/A	N/A	N/A
WA	Commercial	Miscellaneous	New	Miscellaneous	Natural Gas	Pool Heater	A	C0252	Standard (EF .78)	Condensing (EF .90)	6	1,138.84	0.00	0.00	0.00	$12,298.09	$0.00	$0.00	$0.00	$6,836.78	$7,900.46	1 unit	7.0%	100.0% Turnover	UGWeat	85.0% TRD	0.2%	$1,361.05	$1,206.67	0.0	DOE Commercial R&D 2	DOE Commercial R&D 2	DOE Commercial R&D 2

Measure										2021 Measure Information (Unstacked)																												Sources		
State	Sector	Segment	Vintage	End Use	Fuel	Measure	Option	Measure Identifier	Baseline Definition	Efficient Definition	Measure Life (Years)	Unit Energy Savings (Annual kWh or therms)	Unit Summer Peak Savings (kW or n/a)	Unit Winter Peak Savings (kW or n/a)	Unit Incremental Cost ($2018)	Non-Energy Impacts ($2018)	Unit O&M ($2018)	INT Only NRs ($2018)	Incentive ($2018)	Admin Cost ($2018)	Unit of Measure	Base Saturation	Applicability	Discontinuing/Lost Opportunity	Remp Rate Name	20 Year Technical Achievable %	Assigned Loadshape	T&D Losses	TRC LCOE ($/kWh or $/therm)	TRC LCOE Bundle	UCT LCOE ($/kWh or $/therm)	UCT LCOE Bundle	Cumulative Achievable Technical Potential in 2021 DNMs or mTherms	Lifetime Source	Costs Source	Savings Source
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Insulation - Roof/Ceiling	A	WCM1	R-11	R-38	45	0.07	0.00	0.00	$1.11	$0.05	$0.00	$0.00	$0.90	$0.99	sqft roof	0.0%	25.0% Discretionary	Retrofit/Low	86.2% TRC	$208.20		0.0%	$208.20					0.0% RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Insulation - Wall Cavity	A	WCM2	R-3 or less	R-13	45	0.07	0.00	0.00	$1.27	$0.05	$0.00	$0.00	$0.90	$0.99	sqft wall	0.0%	40.0% Discretionary	Retrofit/Low	86.2% TRC	$111.79		0.0%	$111.79					0.0% RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Insulation - Ducting	A	WCM3	"T" Thermal losses	50% reduction in thermal losses	20	0.00	0.00	0.00	$1.54	$0.00	$0.00	$0.00	$0.54	$0.58	sqft	80.0%	60.0% Discretionary	Retrofit/Low	86.2% TRC	$13.75		0.0%	$8.92					0.0% RTF Water - 2019-2021 - CSNSBID - MNSBE.25.01.RI Building Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	HVAC - Duct Repair and Sealing	A	WCM4	Poorly sealed/leaky ducts	30% reduced duct leaking	20	0.00	0.00	0.00	$0.07	$0.00	$0.00	$0.00	$0.02	$0.02	sqft	15.0%	50.0% Discretionary	Retrofit/Low	80.8% TRC	$102.89		0.0%	$65.17					0.0% RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Windows - High Efficiency	A	WCM5	U-3 or worse	U-22 or better	45	0.08	0.00	0.00	$14.13	$0.06	$0.00	$0.00	$1.02	$1.12	sqft window	85.0%	100.0% Discretionary	Retrofit/Low	86.2% TRC	$79.19		0.0%	$79.19					0.0% RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - Maintenance	A	WCM6	Degrade performance	General cleaning and maintenance	3	384.05	0.00	0.00	$0.82	$0.00	$0.00	$0.00	$0.82	$0.90	1000 kBtuh heat	20.0%	30.0% Discretionary	Retrofit/Low	65.8% TRC	$9.61		0.0%	$6.39					1.6% TRM - 6.3.10 - O+M0.5 - TRM - 6.3.10 - O+M0.5 - TRM - 6.3.10 - O+M0.5 - TRM - 6.3.10 - O+M0.5		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - Tune-Up	A	WCM7	Degrade performance	General cleaning and maintenance	3	68.76	0.00	0.00	$0.50	$0.00	$0.00	$0.00	$0.50	$0.55	1000 kBtuh heat	5.0%	10.0% Discretionary	Retrofit/Low	65.8% TRC	$20.63		0.0%	$55.99					7.0% RTF Water - 2018-2021 - CSNSBID - MNSBE.25.01.RI Building Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - Hot Water Reset	W	WCM8	Reset control installed	No control	16	558.82	0.00	0.00	$776.02	$0.00	$0.00	$0.00	$776.02	$853.62	Boiler Cnt	35.0%	55.0% Discretionary	Retrofit/Mod	81.7% TRC	$219.50		0.0%	$147.98					2.0% TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - Hot Water Reset	A	WCM8	Reset control installed	No control	16	558.82	0.00	0.00	$776.02	$0.00	$0.00	$0.00	$776.02	$853.62	Boiler Cnt	100.0%	100.0% Discretionary	Retrofit/Low	81.7% TRC	$219.50		0.0%	$147.98					2.0% TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - High Turndown	A	WCM9	No control	Turndown control installed	15	0.62	0.00	0.00	$2.70	$0.00	$0.00	$0.00	$2.70	$2.97	kBtuh heat	25.0%	50.0% Discretionary	Retrofit/Low	75.8% TRC	$160.63		0.0%	$363.95					2.8% RTF Water - 2018-2021 - CSNSBID - MNSBE.25.01.RI Building Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - Burner Control Optimization	A	WCM11	Average performance	Optimized burner controls	18	0.15	0.00	0.00	$0.91	$0.00	$0.00	$0.00	$0.90	$0.99	kBtuh heat	5.0%	85.0% Discretionary	Retrofit/Low	86.2% TRC	$202.18		0.0%	$163.12					0.0% TRM - 6.4.22 - O+M0.5SBUS_COPTRM Heating MA TRM 5.1 - Downgrade		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	HVAC - Stat Off Damper	A	WCM12	Damper installed	Damper installed	15	17.18	0.00	0.00	$1,860.83	$21.17	$0.00	$0.00	$509.15	$616.06	damper	20.0%	80.0% Discretionary	Retrofit/Low	86.2% TRC	$1,262.19		0.0%	$1,862.32					2.3% TRM - 6.4.14 - O+M0.5 - TRM - 6.4.14 - O+M0.5 - TRM - 6.4.14 - O+M0.5 - TRM - 6.4.14 - O+M0.5		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	HVAC - Demand Controlled Ventilation	A	WCM13	Constant ventilation	DCV installed	15	0.02	0.00	0.00	$0.27	$0.03	$0.00	$0.00	$0.08	$0.09	sqft	100.0%	100.0% Discretionary	Retrofit/Low	86.2% TRC	$357.93		0.0%	$71.80					0.0% RTF_DCV Heating-TPWWHSF_DCV Heating-TPWWHSF_DCV Heating-TPW		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - Stack Economizer	A	WCM14	Economizer installed	Economizer installed	15	0.00	0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	sqft	35.0%	55.0% Discretionary	Retrofit/Low	75.8% TRC	$145.91		0.0%	$145.91					0.0% TRM - 6.4.18 - O+M0.5 - N/A		
MA	Commercial	Office	Existing	Gas Furnace Tuber Inserts	Natural Gas	Gas Furnace Tuber Inserts	A	WCM15	None	Tube inserts installed	5	0.00	0.00	0.00	$1.04	$0.00	$0.00	$0.00	$0.51	$0.56	sqft	0.0%	0.0% Discretionary	Retrofit/Low	86.2% TRC	$389.11		0.0%	$347.36					0.0% N/A		
MA	Commercial	Office	Existing	Gas Boiler - Insulate Steam Lines/Condensate Tank	Natural Gas	Gas Boiler - Insulate Hot Water Lines	A	WCM16	No insulation	Lines and condensate tank insulated	20	2.66	0.00	0.00	$15.19	$0.00	$0.00	$0.00	$15.27	$16.71	boiler piper	35.0%	35.0% Discretionary	Retrofit/Low	86.2% TRC	$208.22		0.0%	$166.58					0.0% RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Gas Boiler - Insulate Hot Water Lines	A	WCM17	No insulation	Insulated water lines	20	4.60	0.00	0.00	$10.78	$0.00	$0.00	$0.00	$15.28	$16.49	boiler piper	80.0%	80.0% Discretionary	Retrofit/Low	86.2% TRC	$301.85		0.0%	$256.96					7.2% RTF Workpaper - SWWH PSB Workpaper - SWWH PSB Workpaper - SWWH		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Space Heating - Heat Recovery Ventilator	A	WCM18	New	HRV installed	15	0.18	0.00	0.00	$4.63	$0.00	$0.00	$0.00	$1.39	$1.53	CFM	5.0%	25.0% Discretionary	Retrofit/Low	80.8% TRC	$366.63		0.0%	$173.31					6.5% TRM - 6.4.27 - O+M0.5 - TRM - 6.4.27 - O+M0.5 - TRM - 6.4.27 - O+M0.5 - TRM - 6.4.27 - O+M0.5		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Thermostat - Programmable	A	WCM19	Manual control	Programmable thermostat installed	11	1.16	0.00	0.00	$171.85	$0.12	$0.00	$0.00	$51.56	$56.71	Stat Unit	10.0%	25.0% Discretionary	Retrofit/Low	80.8% TRC	$1,399.09		0.0%	$1,529.71					1.8% TRM - 6.4.18 - O+M0.5 - TRM - 6.4.18 - O+M0.5 - TRM - 6.4.18 - O+M0.5 - TRM - 6.4.18 - O+M0.5		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	ENERGY STAR Connected Thermostat	A	WCM20	Manual control	Wi-Fi/interactive thermostat installed	5	0.02	0.00	0.00	$0.99	$0.01	$0.00	$0.00	$0.12	$0.13	sqft	50.0%	50.0% Discretionary	Retrofit/Low	80.8% TRC	$357.82		0.0%	$192.14					19.0 Connected Thermostat CanConnected Thermostat CanConnected Thermost		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Commercial Clothes Washers - ENERGY STAR	A	WCM21	Standard laundry machine	ESTAR/high MEF unit installed	7.1	39.51	0.00	0.00	$443.39	$0.00	$20.72	$0.00	$103.02	$118.32	Clothes Washers	0.0%	0.0% Discretionary	Retrofit/Low	86.2% TRC	$1,317.01		0.0%	$1,317.01					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Commercial Clothes Washers - ENERGY STAR	A	WCM22	Standard laundry machine	ESTAR/high MEF unit installed	7.1	39.51	0.00	0.00	$443.39	$0.00	$20.72	$0.00	$103.02	$118.32	Clothes Washers	0.0%	0.0% Discretionary	Retrofit/Low	86.2% TRC	$1,064.00		0.0%	$1,317.01					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Water Heater - Faucet Aerator	A	WCM23	1.5 GPM faucet	1.0 GPM faucet	10	1.42	0.00	0.00	$7.19	$0.00	$0.00	$0.00	$7.19	$7.81	faucet	0.0%	0.0% Discretionary	Retrofit/Low	81.7% TRC	$1,180.28		0.0%	$947.67					0.0% TRM - 6.3.2 - O+M0.5 - LRMF_AER Water Heating - TRM - 6.3.2 - O+M0.5		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Water Heater - Dishwasher Heat Recovery	A	WCM24	None	Drain HR system installed	20	0.85	0.00	0.00	$852.02	$0.00	$0.00	$0.00	$255.61	$281.17	faucet	0.0%	0.0% Discretionary	Retrofit/Low	75.8% TRC	$27,975.97		0.0%	$19,976.95					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Water Heater - Efficient Dishwasher	A	WCM25	Standard unit	ESTAR unit	12	71.00	0.00	0.00	$134.14	$27.59	$0.00	$0.00	$59.51	$65.46	per/dbg	60.0%	60.0% Discretionary	Retrofit/Low	86.2% TRC	$511.60		0.0%	$861.19					2.3% TRM - 6.2.6 - O+M0.5 - TRM - 6.2.6 - O+M0.5 - TRM - 6.2.6 - O+M0.5 - TRM - 6.2.6 - O+M0.5		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Water Heater - Pre-Rinse Spray Valve	A	WCM26	1.5 GPM kitchen sprayer	2 GPM sprayer nozzle	4	24.96	0.00	0.00	$79.68	$91.03	$0.00	$0.00	$25.00	$27.50	kitchen/facilit	25.0%	65.0% Discretionary	Retrofit/Low	86.2% TRC	$1,982.02		0.0%	$1,982.02					1.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Water Heater - Central Controls	A	WCM27	Non-central controls	Central water boiler controls installed	15	208.87	0.00	0.00	$2,148.55	$0.00	$0.00	$0.00	$1,024.55	$1,126.99	per/bldg	1.0%	5.0% Discretionary	Retrofit/Low	75.8% TRC	$2,302.68		0.0%	$1,802.41					0.0% TRM - 6.2.5 - O+M0.5 - TRM - 6.2.5 - O+M0.5 - TRM - 6.2.5 - O+M0.5 - TRM - 6.2.5 - O+M0.5		
MA	Commercial	Office	Existing	Water Heating	Natural Gas	Water Heater - Solar System	A	WCM28	None	Solar system installed	20	3.66	0.00	0.00	$296.24	$0.00	$0.57	$0.00	$88.87	$97.76	DHW Module	1.0%	30.0% Discretionary	Retrofit/Low	75.8% TRC	$1,382.90		0.0%	$1,533.69					48.0 RTF 2021 - Solar water heater - 2021 - Solar water heater - 2021 - Solar water heater		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Destratification Fans (HVLS)	A	WCM29	None/Standard ventilation	Fans installed	10	232.89	0.00	0.00	$6,939.25	$168.99	$0.00	$0.00	$2,081.78	$2,289.95	Stat Fan	15.0%	20.0% Discretionary	Retrofit/Low	80.8% TRC	$8,895.85		0.0%	$2,212.26					1.9% TRM - 6.4.31 - O+M0.5 - TRM - 6.4.31 - O+M0.5 - TRM - 6.4.31 - O+M0.5 - TRM - 6.4.31 - O+M0.5		
MA	Commercial	Office	Existing	Kitchen Hood - DCV/Shelf	Natural Gas	Kitchen Hood - DCV/Shelf	A	WCM30	Standard kitchen hood	DCV/Shelf vent hood	10	1,029.80	0.00	0.00	$11,219.99	$0.00	$0.00	$0.00	$1,778.89	$1,956.34	kitch hood	10.0%	10.0% Discretionary	Retrofit/Low	86.2% TRC	$1,857.01		0.0%	$645.25					0.0 DCV_DSKV Ventilation - TRM - 4.2.16 - O+FR VCDCV_DSKV Ventilation		
MA	Commercial	Office	Existing	Miscellaneous	Natural Gas	Food Heater - Night Covers	S	WCM31	No cover	Night cover in place	5	0.00	0.00	0.00	$2.07	$0.02	$0.00	$0.00	$0.62	$0.68	sqft pool	50.0%	100.0% Discretionary	Retrofit/Low	80.8% TRC	$528.86		0.0%	$326.18					0.0% _CSV Water Heating SCA ETRM - Food Cooker, GCA ETRM - Food Cooker, G		
MA	Commercial	Office	Existing	Lighting	Natural Gas	Building Automation System	A	WCM32	No control system	Automation system installed and programmed	15	0.00	0.00	0.00	$0.16	$0.01	$0.00	$0.00	$0.09	$0.10	sqft	10.0%	10.0% Discretionary	Retrofit/Low	86.8% TRC	$375.61		0.0%	$211.10					0.0 CSE_EMS 40-50 ECO-20 DBMS-EV_EMS-EV PCIC 20 CSE_EMS-EV ECO-15 C		
MA	Commercial	Office	Existing	Lighting	Natural Gas	Building Automation System	B	WCM32	No control system	Automation system installed and programmed	15	0.00	0.00	0.00	$0.16	$0.01	$0.00	$0.00	$0.09	$0.10	sqft	10.0%	10.0% Discretionary	Retrofit/Low	86.8% TRC	$375.61		0.0%	$211.10					0.0 CSE_EMS 40-50 ECO-20 DBMS-EV_EMS-EV PCIC 20 CSE_EMS-EV ECO-15 C		
MA	Commercial	Office	Existing	Lighting	Natural Gas	Lighting - Occupancy Sensors	A	WCM33	No control system	Occupancy sensor installed	10	0.01	0.00	0.00	$0.16	$0.00	$0.00	$0.00	$0.02	$0.02	sqft	50.0%	60.0% Discretionary	Retrofit/Low	86.8% TRC	$1,000.07		0.0%	$1,000.07					0.0 CSE_COM_Lighting-Occupancy-Sensor-Wall-Mounted		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Commissioning - HVAC	A	WCM34	New construction code	Optimized HVAC design and controls	10	0.00	0.00	0.00	$0.27	$0.02	$0.00	$0.00	$0.08	$0.09	sqft	100.0%	100.0% Discretionary	Retrofit/Low	86.2% TRC	$397.96		0.0%	$397.96					0.0 CSE_CC_CSV_Cx-Bldg-Building-commissioning-Building-commissioning		
MA	Commercial	Office	Existing	Space Heating	Natural Gas	Retrocommissioning - HVAC	A	WCM35	Unbalanced heating	Optimized HVAC flow and controls	7	0.00	0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	per/Btu	90.0%	60.0% Discretionary	Retrofit/Low	80.8% TRC	$223.93		0.0%	$123.16					0.0% RCX-HS-SCH10-20CONC_RCX-HP-SCH10-20CONC_RCX-SH-SCH10-2		
MA	Commercial	Office	Existing	Strategic Energy Management	Natural Gas	Strategic Energy Management	A	WCM36	Energy management system	Energy management system installed and programmed	3	0.00	0.00	0.00	$0.17	$0.01	$0.00	$0.00	$0.08	$0.08	sqft	5.0%	5.0% Discretionary	Retrofit/Low	80.8% TRC	$563.09		0.0%	$627.28					2.0% RCX-CT_CSV_SBM-Misc-2010_COM_SBM-Misc-2010_COM_SBM-Misc-2		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Insulation - Roof/Ceiling	A	WCM37	R-11	R-38	45	0.07	0.00	0.00	$1.11	$0.05	$0.00	$0.00	$0.90	$0.99	sqft roof	0.0%	0.0% Discretionary	Retrofit/Low	84.2% TRC	$129.54		0.0%	$89.68					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Insulation - Wall Cavity	A	WCM38	R-3 or less	R-13	45	0.07	0.00	0.00	$1.27	$0.05	$0.00	$0.00	$0.90	$0.99	sqft wall	0.0%	0.0% Discretionary	Retrofit/Low	84.2% TRC	$111.08		0.0%	$68.66					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Insulation - Ducting	A	WCM39	"T" Thermal losses	50% reduction in thermal losses	20	0.00	0.00	0.00	$0.76	$0.00	$0.00	$0.00	$0.25	$0.28	sqft	80.0%	80.0% Discretionary	Retrofit/Low	86.2% TRC	$113.75		0.0%	$58.92					0.0 RTF Water - 2019-2021 - CSNSBID - MNSBE.25.01.RI Building Energy Simulation		
MA	Commercial	New	Existing	Space Heating	Natural Gas	HVAC - Duct Repair and Sealing	A	WCM40	Poorly sealed/leaky ducts	30% reduced duct leaking	20	0.00	0.00	0.00	$0.07	$0.00	$0.00	$0.00	$0.02	$0.02	sqft	15.0%	50.0% Discretionary	Retrofit/Low	80.8% TRC	$102.89		0.0%	$65.17					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Windows - High Efficiency	A	WCM41	U-3 or worse	U-22 or better	45	0.08	0.00	0.00	$14.13	$0.06	$0.00	$0.00	$1.02	$1.12	sqft window	85.0%	100.0% Discretionary	Retrofit/Low	86.8% TRC	$79.19		0.0%	$79.19					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Boiler - Maintenance	A	WCM42	Degrade performance	General cleaning and maintenance	3	429.68	0.00	0.00	$0.82	$0.00	$0.00	$0.00	$0.82	$0.90	1000 kBtuh heat	20.0%	30.0% Discretionary	Retrofit/Low	65.8% TRC	$9.61		0.0%	$5.80					0.0 TRM - 6.3.10 - O+M0.5 - TRM - 6.3.10 - O+M0.5 - TRM - 6.3.10 - O+M0.5 - TRM - 6.3.10 - O+M0.5		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Furnace - Maintenance	A	WCM43	Degrade performance	General cleaning and maintenance	3	77.01	0.00	0.00	$0.82	$0.00	$0.00	$0.00	$0.82	$1.01	1000 kBtuh heat	5.0%	10.0% Discretionary	Retrofit/Low	65.8% TRC	$18.48		0.0%	$22.23					1.5% TRM - 6.4.21 - O+M0.5 - TRM - 6.4.21 - O+M0.5 - TRM - 6.4.21 - O+M0.5 - TRM - 6.4.21 - O+M0.5		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Boiler - Hot Water Reset	W	WCM44	No control	Reset control installed	16	610.73	0.00	0.00	$776.02	$0.00	$0.00	$0.00	$776.02	$853.62	Boiler Cnt	35.0%	55.0% Discretionary	Retrofit/Mod	81.7% TRC	$202.65		0.0%	$219.68					0.0% TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Boiler - Hot Water Reset	A	WCM44	No control	Reset control installed	16	610.73	0.00	0.00	$776.02	$0.00	$0.00	$0.00	$776.02	$853.62	Boiler Cnt	100.0%	100.0% Discretionary	Retrofit/Low	81.7% TRC	$202.65		0.0%	$219.68					0.0% TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5 - TRM - 6.4.2 - O+M0.5		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Boiler - High Turndown	A	WCM45	No control	Turndown control installed	15	0.67	0.00	0.00	$2.70	$0.00	$0.00	$0.00	$2.70	$2.97	kBtuh heat	100.0%	100.0% Discretionary	Retrofit/Low	75.8% TRC	$160.63		0.0%	$167.72					0.0% TRM - 6.3.1 - Boiler - MultiBtu TRM 5.1 - Boiler - MultiBtu TRM 5.1 - Boiler - MultiBtu TRM 5.1 - Boiler - MultiBtu		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Boiler - Burner Control Optimization	A	WCM46	Average performance	Optimized burner controls	18	0.14	0.00	0.00	$0.91	$0.00	$0.00	$0.00	$0.86	$0.93	kBtuh heat	5.0%	85.0% Discretionary	Retrofit/Low	86.2% TRC	$214.69		0.0%	$214.78					0.0% TRM - 6.4.22 - O+M0.5SBUS_COPTRM Heating MA TRM 5.1 - Downgrade		
MA	Commercial	New	Existing	Space Heating	Natural Gas	HVAC - Stat Off Damper	A	WCM47	Damper installed	Damper installed	15	17.18	0.00	0.00	$1,860.83	$21.17	$0.00	$0.00	$509.15	$616.06	Boiler Cnt	20.0%	70.0% Discretionary	Retrofit/Low	86.2% TRC	$1,896.30		0.0%	$1,862.32					2.3% TRM - 6.4.14 - O+M0.5 - TRM - 6.4.14 - O+M0.5 - TRM - 6.4.14 - O+M0.5 - TRM - 6.4.14 - O+M0.5		
MA	Commercial	New	Existing	Space Heating	Natural Gas	HVAC - Demand Controlled Ventilation	A	WCM48	Constant ventilation	DCV installed	15	0.02	0.00	0.00	$0.27	$0.03	$0.00	$0.00	$0.08	$0.09	sqft	100.0%	100.0% Discretionary	Retrofit/Low	86.2% TRC	$58.75		0.0%	$83.03					0.0% RTF_DCV Heating-TPWWHSF_DCV Heating-TPWWHSF_DCV Heating-TPW		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Boiler - Stack Economizer	A	WCM49	Economizer installed	Economizer installed	15	0.00	0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	sqft	35.0%	55.0% Discretionary	Retrofit/Low	75.8% TRC	$181.61		0.0%	$181.61					0.0% TRM - 6.4.18 - O+M0.5 - N/A		
MA	Commercial	New	Existing	Gas Furnace Tuber Inserts	Natural Gas	Gas Furnace Tuber Inserts	A	WCM50	None	Tube inserts installed	5	0.00	0.00	0.00	$1.04	$0.00	$0.00	$0.00	$0.51	$0.56	sqft	0.0%	0.0% Discretionary	Retrofit/Low	86.2% TRC	$389.11		0.0%	$347.36					0.0% N/A		
MA	Commercial	New	Existing	Gas Boiler - Insulate Steam Lines/Condensate Tank	Natural Gas	Gas Boiler - Insulate Hot Water Lines	A	WCM51	No insulation	Lines and condensate tank insulated	20	2.66	0.00	0.00	$15.19	$0.00	$0.00	$0.00	$15.27	$16.71	boiler piper	35.0%	35.0% Discretionary	Retrofit/Low	86.2% TRC	$208.22		0.0%	$166.58					0.0% RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Gas Boiler - Insulate Hot Water Lines	A	WCM52	No insulation	Insulated water lines	20	4.60	0.00	0.00	$10.78	$0.00	$0.00	$0.00	$15.28	$16.49	boiler piper	80.0%	80.0% Discretionary	Retrofit/Low	86.2% TRC	$301.85		0.0%	$256.96					0.0 RTF Workpaper - SWWH PSB Workpaper - SWWH PSB Workpaper - SWWH		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Space Heating - Heat Recovery Ventilator	A	WCM53	New	HRV installed	15	0.18	0.00	0.00	$4.63	$0.00	$0.00	$0.00	$1.39	$1.53	CFM	5.0%	10.0% Discretionary	Retrofit/Low	80.8% TRC	$366.63		0.0%	$168.15					5.0% TRM - 6.4.27 - O+M0.5 - TRM - 6.4.27 - O+M0.5 - TRM - 6.4.27 - O+M0.5 - TRM - 6.4.27 - O+M0.5		
MA	Commercial	New	Existing	Space Heating	Natural Gas	Thermostat - Programmable	A	WCM54	Manual control	Programmable thermostat installed	11	2.34	0.00	0.00	$171.85	$0.24	$0.00	$0.00	$51.56	$56.71	Stat Unit	10.0%	10.0% Discretionary	Retrofit/Low	80.8% TRC	$1,399.09		0.0%	$1,307.91					1.0% TRM - 6.4.18 - O+M0.5 - TRM - 6.4.18 - O+M0.5 - TRM - 6.4.18 - O+M0.5 - TRM - 6.4.18 - O+M0.5		
MA	Commercial	New	Existing	Space Heating	Natural Gas	ENERGY STAR Connected Thermostat	A	WCM55	Manual control	Wi-Fi/interactive thermostat installed	5	0.03	0.00	0.00	$0.99	$0.01	$0.00	$0.00	$0.12	$0.13	sqft	35.0%	35.0% Discretionary	Retrofit/Low	80.8% TRC	$936.95		0.0%	$261.42					18.0 Connected Thermostat CanConnected Thermostat CanConnected Thermost		
MA	Commercial	New	Existing	Water Heating	Natural Gas	Water Heater - Clothes Washer	A	WCM56	Standard laundry machine	Clothes Washer	10	21,129.00	0.00	0.00	$1,117.83	$0.00	$0.00	$0.00	$2,000.00	$2,200.00	clw	100.0%	100.0% Discretionary	Retrofit/Low	86.2% TRC	$1,000.00		0.0%	$1,000.00					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Water Heating	Natural Gas	Commercial Clothes Washers - ENERGY STAR	A	WCM57	Standard laundry machine	ESTAR/high MEF unit installed	7.1	39.51	0.00	0.00	$443.39	$0.00	$20.72	$0.00	$103.02	$118.32	Clothes Washers	0.0%	0.0% Discretionary	Retrofit/Low	86.2% TRC	$1,317.01		0.0%	$1,317.01					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Water Heating	Natural Gas	Commercial Clothes Washers - ENERGY STAR	A	WCM58	Standard laundry machine	ESTAR/high MEF unit installed	7.1	39.51	0.00	0.00	$443.39	$0.00	$20.72	$0.00	$103.02	$118.32	Clothes Washers	0.0%	0.0% Discretionary	Retrofit/Low	86.2% TRC	$1,064.00		0.0%	$1,317.01					0.0 RTF Water - CoreStandardRTF Water - CoreStandardBuilding Energy Simulation		
MA	Commercial	New	Existing	Water Heating	Natural Gas	Water Heater - Faucet Aerator	A	WCM59	1.5 GPM faucet	1.0 GPM faucet	10	1.42	0.00	0.00	$7.19	$0.00	$0.00	$0.00	$7.19	$7.81	faucet	0.0%	0.0% Discretionary	Retrofit/Low	81.7% TRC	$1,180.28		0.0%	$947.67					0.0% TRM - 6.3.2 - O+M0.5 - LRMF_AER Water Heating - TRM - 6.3.2 - O+M0.5		
MA	Commercial	New	Existing	Water Heating	Natural Gas	Water Heater - Dish

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WA	Commercial	Miscellaneous	New	Water Heating	Natural Gas	Water Heater - Pre-Rinse Spray Valve	A	WCM073	1.5 GPM kitchen sprayer	2 GPM sprayer nozzle	4	24.96	0.00	0.00	$79.68	$91.03	$0.00	$0.00	$21.00	$27.50	KitchenFaucet	25.0%	65.0% Discretionary	Retrofit20ind	75.0% TBD	0.2%	$6,299.82	$521.37	0.0[illegible] RTF Walk - CoreCooling/RTF Walk - CoreCooling
WA	Commercial	Miscellaneous	New	Water Heating	Natural Gas	Water Heater - Central Controls	A	WCM074	No central controls	Central water boiler controls installed	15	97.72	0.00	0.00	$1,146.00	$0.00	$0.00	$0.00	$1,146.50	$1,360.83	perBldg	5.0%	15.0% Discretionary	Retrofit20ind	75.0% TBD	0.2%	$1,356.57	$3,714.15	0.01 TRM - 4.1.6 - CI-HWR-CL TRM - 4.1.6 - CI-HWR-CL TRM - 4.1.6 - CI-HWR-C
WA	Commercial	Miscellaneous	New	Water Heating	Natural Gas	Water Heater - Solar System	A	WCM075	None	Solar system installed	20	3.44	0.00	0.00	$296.24	$0.00	$0.57	$0.00	$88.87	$97.76	DHW Mech	1.0%	30.0% Discretionary	Retrofit20ind	75.0% TBD	0.2%	$1,761.64	$1,317.88	0.03 MID 2021 - Solar water h.MID 2021 - Solar water h.MID 2021 - Solar water h
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Destratification Fans (HVLS)	A	WCM076	None/Standard ventilation	Fans installed	10	426.17	0.00	0.00	$6,939.25	$691.35	$0.00	$0.00	$2,178.96	$2,396.86	Stud Fan	35.0%	20.0% Discretionary	Retrofitover20	80.8% TBD	0.2%	$2,854.21	$1,211.02	0.27 TRM - 4.1.16 - CI-HVC-SL TRM - 4.1.16 - CI-HVC-SL TRM - 4.1.16 - CI-HVC
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Kitchen Hood - DCV/MUA	A	WCM077	Standard kitchen hood	DCV/MUA vent hood	20	730.08	0.00	0.00	$1,212.69	$927.80	$0.00	$0.00	$1,212.69	$1,333.95	Kitch Hood	10.0%	10.0% Discretionary	Retrofitover20	80.8% TBD	0.2%	$689.12	$232.01	0.04 DEER_EMVD Ventilation-S.TRM - 4.2.16 - CI-FSE-VCDDE_EMVD Ventilation
WA	Commercial	Miscellaneous	New	Miscellaneous	Natural Gas	Pool Heater - Night Covers	A	WCM078	No cover	Night cover in place	5	0.01	0.00	0.00	$2.07	$0.02	$0.00	$0.00	$0.02	$0.68	sqft pool	100.0%	100.0% Discretionary	Retrofitover20	80.8% TBD	0.2%	$542.89	$308.95	0.0[illegible] CSV-Water Heating-SC.xLsx-PRH - Pool Cover, Cx15.xlsx-PRH - Pool Cover, C
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Building Automation System	A	WCM079	No control system	Automation system installed and programmed	15	0.04	0.00	0.00	$0.21	$0.04	$0.00	$0.00	$0.10	$0.11	sqft	10.0%	0.0% Discretionary	Retrofit30ind	84.8% TBD	0.2%	$176.00	$113.11	0.0[illegible]COM_EMS-BE-BCXLCD-2008WAV_EN-BR-PVLC-2002COM_EMS-BR-BCXLCD-2
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Steam System Efficiency Improvements	A	WCM080	Average system efficiency	Optimized system	5	0.00	0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	sqft	30.0%	60.0% Discretionary	Retrofit30ind	84.8% TBD	0.2%	$389.11	$167.36	0.0[illegible]COM_EMS-BE-BCXLCD-2008WAV_EN-BR-PVLC-2002COM_EMS-BR-BCXLCD-2
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Commissioning - HVAC	A	WCM082	New construction code	Optimized HVAC design and controls	10	0.02	0.00	0.00	$0.27	$0.02	$0.00	$0.00	$0.08	$0.09	sqft	100.0%	100.0% Discretionary	LrgBldgall	85.0% TBD	0.2%	$397.01	$99.51	0.0[illegible]COM_CX-Refrig-20Building commissioning-LCOM_CX-ER-BAS-S
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Retrocommissioning - HVAC	A	WCM083	Vintage/existing building	Optimized HVAC flow and controls	5	0.00	0.00	0.00	$1.17	$0.00	$0.00	$0.00	$0.38	$0.42	sqft	0.0%	0.0% Discretionary	Retrofitover20	80.8% TBD	0.2%	$389.11	$167.36	0.0[illegible] N/A	N/A
WA	Commercial	Miscellaneous	New	Space Heating	Natural Gas	Strategic Energy Management	A	WCM084	No energy management system	Energy management system installed and programmed	3	0.01	0.00	0.02	$0.20	$0.06	$0.00	$0.00	$0.06	$0.07	sqft	0.0%	0.0% Discretionary	Retrofitover20	80.8% TBD	0.2%	$909.80	$286.61	0.0[illegible]COM_SEM-Misc-2012C_COM_SEM-Misc-2012C_COM_SEM-Misc-2

Measure												2021 Measure Information (Unstacked)																												Sources		
State	Sector	Segment	Vintage	End Use	Fuel	Measure	Option	Measure Identifier	Baseline Definition	Efficient Definition	Measure Life (Years)	Unit Energy Savings (Annual kWh or therms)	Unit Summer Peak Savings (kW or n/a)	Unit Winter Peak Savings (kW or n/a)	Unit Incremental Cost ($2019)	Non-Energy Impacts ($2019)	Inc. O&M ($2019)	RVT-Only NTG ($2019)	Incentive ($2019)	Admin Cost ($2019)	Unit of Measure	Base Saturation	Shoestringing/Cost Opportunity	Ramp Rate Name	20 Year Technical Achievable %	Assigned Loadshape	TRO Losses	TRC LCOE ($/kWh or $/therm)	TRC LCOE Bundle	UCT LCOE ($/kWh or $/therm)	UCT LCOE Bundle	Cumulative Achievable Technical Potential in 2021 (kWh or mTherms)	Lifetime Source	Costs Source	Savings Source
MA	Industrial	Food Products	Existing	Space Heating	Natural Gas	Furnace	A	001	AFUE 80% (Standard)	AFUE 96%	25	1,605.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	39.5%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Food Products	Existing	Space Heating	Natural Gas	Boiler	A	002	AFUE 80% (Standard)	AFUE 96%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	12.1%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Food Products	Existing	Space Heating	Natural Gas	Unit Heater	A	003	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	21.8%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Food Products	New	Space Heating	Natural Gas	Furnace	A	004	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	33.5%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Food Products	New	Space Heating	Natural Gas	Boiler	A	005	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	11.9%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Food Products	New	Space Heating	Natural Gas	Unit Heater	A	006	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	21.8%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Agriculture	Existing	Space Heating	Natural Gas	Furnace	A	007	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	24.0%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Agriculture	Existing	Space Heating	Natural Gas	Boiler	A	008	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	12.1%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Agriculture	Existing	Space Heating	Natural Gas	Unit Heater	A	009	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	21.8%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Agriculture	New	Space Heating	Natural Gas	Furnace	A	010	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	24.0%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Agriculture	New	Space Heating	Natural Gas	Boiler	A	011	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	12.1%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Agriculture	New	Space Heating	Natural Gas	Unit Heater	A	012	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	29.6%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Primary Metals	Existing	Space Heating	Natural Gas	Furnace	A	013	AFUE 80% (Standard)	AFUE 96%	25	1,605.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	42.6%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Primary Metals	Existing	Space Heating	Natural Gas	Boiler	A	014	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	2.8%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Primary Metals	Existing	Space Heating	Natural Gas	Unit Heater	A	015	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	49.1%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Primary Metals	New	Space Heating	Natural Gas	Furnace	A	016	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	42.6%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Primary Metals	New	Space Heating	Natural Gas	Boiler	A	017	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	2.8%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Primary Metals	New	Space Heating	Natural Gas	Unit Heater	A	018	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	49.1%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Stone, Clay, and Glass	Existing	Space Heating	Natural Gas	Furnace	A	019	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	28.8%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Stone, Clay, and Glass	Existing	Space Heating	Natural Gas	Boiler	A	020	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	9.0%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Stone, Clay, and Glass	Existing	Space Heating	Natural Gas	Unit Heater	A	021	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	25.2%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Stone, Clay, and Glass	New	Space Heating	Natural Gas	Furnace	A	022	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	28.8%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Stone, Clay, and Glass	New	Space Heating	Natural Gas	Boiler	A	023	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	9.0%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Stone, Clay, and Glass	New	Space Heating	Natural Gas	Unit Heater	A	024	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	25.2%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Petroleum	Existing	Space Heating	Natural Gas	Furnace	A	025	AFUE 80% (Standard)	AFUE 96%	25	1,605.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	0.3%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Petroleum	Existing	Space Heating	Natural Gas	Boiler	A	026	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	1.1%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Petroleum	Existing	Space Heating	Natural Gas	Unit Heater	A	027	Standard	Infrared Radiant	15	0.00	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	0.0%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$96,112.14		$60.00				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Petroleum	New	Space Heating	Natural Gas	Furnace	A	028	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	1.1%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Petroleum	New	Space Heating	Natural Gas	Boiler	A	029	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	1.1%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Petroleum	New	Space Heating	Natural Gas	Unit Heater	A	030	Standard	Infrared Radiant	15	0.00	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	0.0%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$96,112.14		$60.00				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Paper and Printing	Existing	Space Heating	Natural Gas	Furnace	A	031	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	38.0%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Paper and Printing	Existing	Space Heating	Natural Gas	Boiler	A	032	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	2.5%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Paper and Printing	Existing	Space Heating	Natural Gas	Unit Heater	A	033	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	61.7%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Paper and Printing	New	Space Heating	Natural Gas	Furnace	A	034	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	38.0%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Paper and Printing	New	Space Heating	Natural Gas	Boiler	A	035	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	2.5%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Paper and Printing	New	Space Heating	Natural Gas	Unit Heater	A	036	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	61.7%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Instruments	Existing	Space Heating	Natural Gas	Furnace	A	037	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	39.7%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Instruments	Existing	Space Heating	Natural Gas	Boiler	A	038	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	3.3%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Instruments	Existing	Space Heating	Natural Gas	Unit Heater	A	039	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	38.9%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Instruments	New	Space Heating	Natural Gas	Furnace	A	040	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	3.3%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Instruments	New	Space Heating	Natural Gas	Boiler	A	041	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	3.3%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Instruments	New	Space Heating	Natural Gas	Unit Heater	A	042	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	38.9%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Wood and Lumber Products	Existing	Space Heating	Natural Gas	Furnace	A	043	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	49.1%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Wood and Lumber Products	Existing	Space Heating	Natural Gas	Boiler	A	044	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	29.1%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Wood and Lumber Products	Existing	Space Heating	Natural Gas	Unit Heater	A	045	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	11.3%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Wood and Lumber Products	New	Space Heating	Natural Gas	Furnace	A	046	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	49.1%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Wood and Lumber Products	New	Space Heating	Natural Gas	Boiler	A	047	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	11.3%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Wood and Lumber Products	New	Space Heating	Natural Gas	Unit Heater	A	048	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	11.3%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Other Industrial	Existing	Space Heating	Natural Gas	Furnace	A	049	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	68.6%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.35				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Other Industrial	Existing	Space Heating	Natural Gas	Boiler	A	050	AFUE 80% (Standard)	AFUE 97%	25	6,227.32	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	8.9%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.52		$273.98				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Other Industrial	Existing	Space Heating	Natural Gas	Unit Heater	A	051	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	32.4%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	
MA	Industrial	Other Industrial	New	Space Heating	Natural Gas	Furnace	A	052	AFUE 80% (Standard)	AFUE 96%	25	1,603.55	0.00	0.00	$1,826.85	$10.15	$0.00	$0.00	$968.52	$605.15	400 kBtu/hr	68.6%	30.0% Turnover	LCUSheet	25.0% TRO	0.2%	$92.39		$33.36				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	ARI 8697	
MA	Industrial	Other Industrial	New	Space Heating	Natural Gas	Boiler	A	053	AFUE 80% (Standard)	AFUE 97%	25	6,219.58	0.00	0.00	$14,611.16	$0.00	$0.00	$0.00	$11,751.68	$15,126.85	800 kBtu/hr	8.9%	100.0% Turnover	LCUSheet	85.0% TRO	0.2%	$309.71		$273.54				0.0%	MA 2018 Tech Forecast	GS 2018 Tech Forecast	GBUR Heating-EG16-101	
MA	Industrial	Other Industrial	New	Space Heating	Natural Gas	Unit Heater	A	054	Standard	Infrared Radiant	15	43,680.55	0.00	0.00	$85,063.63	$1,987.78	$0.00	$0.00	$25,408.01	$27,968.81	125 kBtu/hr	32.4%	100.0% Turnover	LCUSheet	84.7% TRO	0.2%	$296.03		$103.50				0.0%	TRM - 6.1.12 - CI+HO	CNGC Program Data	S. TRM - 6.1.12 - CI+HO	

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