State-Level Benefits from Potential Federal Appliance Standards

New York																
Summary of Benefits by Product				Annual Savings in 2020				Annual Savings in 2030				Economics			
Products	Effective Date	Annual Savings per Unit	Incre-mental Cost per Unit[1]	Electricity	Primary Energy	Summer Peak Capacity	Value of Bill Savings[2]	Electricity	Primary Energy	Summer Peak Capacity	Value of Bill Savings[2]	Pay Back Period[3]	Benefit / Cost Ratio[4]	Net Present Value[5]	Cumulative Energy Savings through 2030
	Year	kWh, {gal}, or [therms]	$	GWh	BBtu	MW	$Million	GWh	BBtu	MW	$Million	Years		$Million (2009$)	TBtu
Residential															
Battery chargers	2014	4	$ 1	565.1	5,890.8	78.0	$ 106.2	565.1	5,682.8	78.0	$ 106.2	0.8	6.6	$ 677	82.5
Central AC & HP	2016	545	$ 255	224.5	2,340.1	190.8	$ 42.2	723.4	7,274.2	614.7	$ 135.9	2.5	3.1	$ 542	58.5
Clothes dryers *(total)*	2014	-	$ 50	224.2	2,554.5	33.3	$ 45.8	569.2	6,275.0	84.6	$ 116.2	-	3.6	$ 539	56.8
(electricity)	2014	93	$ 50	224.2	2,337.2	33.3	$ 42.1	569.2	5,723.5	84.6	$ 106.9	2.9	4.2	$ 522	52.0
(gas)	2014	[3.5]	$ 50	-	217.2	-	$ 3.6	-	551.4	-	$ 9.2	8.5	1.4	$ 17	4.8
Clothes washers *(total)*[6]	2015	244	$ 96	234.9	3,687.6	34.9	$ 64.9	469.8	7,202.3	69.9	$ 129.8	-	5.2	$ 1,231	77.4
(electricity - machine)	2015	22	$ 9	46.1	480.2	6.8	$ 8.7	92.1	926.4	13.7	$ 17.3	1.5	9.3	$ 79	10.1
(electricity - water heating)	2015	222	$ 87	188.9	1,968.7	28.1	$ 35.5	377.7	3,798.3	56.2	$ 71.0	-	-	$ 326	41.3
(gas)	2015	[10.1]	$ 87	-	1,238.8	-	$ 20.7	-	2,477.6	-	$ 41.5	2.4	5.9	$ 97	26.0
(water)	2015	{5233.5}	$ -	Bil. Gal.-->	17.0	-	$ -	Bil. Gal.-->	34.0	-	$ -	-	-	$ 729	-
Direct heaters	2013	48	$ 326	-	632.1	-	$ 10.4	-	1,272.8	-	$ 21.4	3.6	2.9	$ 91	13.3
(gas)	2013	[64.9]	$ 326	-	755.1	-	$ 12.6	-	1,510.1	-	$ 25.3	3.0	3.5	$ 121	15.9
External power supplies	2013	2	$ 1	128.4	1,339.0	17.7	$ 24.1	128.4	1,291.7	17.7	$ 24.1	2.5	2.0	$ 86	19.4
Furnaces *(gas)*	2013	[78.4]	$ 520	-	3,440.5	-	$ 57.6	-	8,027.9	-	$ 134.5	4.0	2.9	$ 563	74.3
Furnaces *(oil)*	2013	[32.4]	$ 17	-	192.5	-	$ 4.6	-	449.1	-	$ 7.5	0.3	103.6	$ 67	4.2
Furnace fans	2016	557	$ 100	413.4	4,309.3	115.2	$ 77.7	1,332.1	13,395.4	371.3	$ 250.3	1.0	10.5	$ 1,326	107.7
Microwave ovens	2012	16	$ 2	109.6	1,142.2	16.3	$ 20.6	116.0	1,166.7	17.3	$ 21.8	0.8	9.4	$ 162	17.5
Pool heaters	2013	[20]	$ 44	-	182.4	-	$ 3.1	-	182.4	-	$ 3.1	1.3	3.9	$ 19	2.7
Refrigerators	2014	130	$ 52	411.2	4,286.6	61.9	$ 77.3	1,043.9	10,497.2	157.0	$ 196.1	2.1	5.6	$ 1,034	95.3
Room AC	2014	86	$ 35	105.2	1,096.8	148.1	$ 19.8	202.3	2,034.7	284.9	$ 38.0	2.2	4.2	$ 189	22.7
Water heaters	2013	-	$ -	478.4	7,936.2	66.0	$ 139.3	893.0	13,699.1	123.2	$ 246.8	-	6.5	$ 1,452	159.0
(electricity)	2013	220	$ 65	478.4	4,986.9	66.0	$ 89.9	893.0	8,980.2	123.2	$ 167.8	1.6	6.3	$ 968	102.4
(gas)	2013	[14]	$ 30	-	2,949.3	-	$ 49.4	-	4,718.9	-	$ 79.0	1.3	7.0	$ 484	56.6
Commercial															
Beverage vending machines	2012	682	$ 157	16.3	169.6	3.8	$ 2.7	26.8	269.6	6.2	$ 4.4	1.4	7.1	$ 28	3.4
Commercial boilers	2013	[513.6]	$ 2,968	-	264.5	-	$ 3.4	-	617.2	-	$ 8.0	4.5	3.4	$ 48	5.7
Clothes washers *(total)*[6]	2012	-	$ 503	19.5	630.2	6.4	$ 10.4	24.5	782.0	8.0	$ 10.9	5.6	1.7	$ 46	10.8
(electricity)	2012	208	$ 446	19.5	203.1	6.4	$ 3.2	24.5	246.0	8.0	$ 4.0	-	-	$ (19)	3.5
(gas)	2012	[26.8]	$ 57	-	427.0	-	$ 7.2	-	536.1	-	$ 6.9	-	-	$ 44	7.3
(water)	2012	{5827}	$ -	Bil. Gal.-->	0.6	-	$ -	Bil. Gal.-->	0.7	-	$ -	-	-	$ 21	-
Fluorescent ballasts	2014	18	$ 2	114.6	1,194.4	37.5	$ 18.8	282.7	2,843.2	92.5	$ 53.1	0.7	15.5	$ 262	26.5
Fluorescent lamps	2012	11	$ 2	1,573.6	16,403.1	514.9	$ 258.9	1,573.6	15,824.0	514.9	$ 258.9	1.3	3.5	$ 1,679	268.3
Incandescent reflector lamps	2012	62	$ 3	465.1	4,847.8	114.7	$ 76.5	465.1	4,676.7	114.7	$ 76.5	0.3	5.3	$ 711	89.1
BR \ exempted reflector lamps	2013	38	$ 1	211.0	2,199.4	52.1	$ 34.7	211.0	2,121.8	52.1	$ 34.7	0.2	4.8	$ 254	40.4
Liquid-immersed transformers	2016	2	$ 2	36.9	384.6	5.1	$ 6.1	118.9	1,195.5	16.4	$ 19.6	5.8	2.6	$ 95	9.6
Low-voltage dry type transformers	2016	25	$ 5	157.7	1,643.9	21.8	$ 29.6	508.2	5,110.1	70.1	$ 83.6	1.3	11.7	$ 595	41.1
Metal halide lamp fixtures	2015	360	$ 35	282.6	2,946.3	92.5	$ 53.1	796.5	8,010.1	260.7	$ 131.0	0.6	21.2	$ 803	68.6
Reach-in refrigerators and freezers	2016	1,658	$ 199	48.8	508.2	11.3	$ 9.2	130.0	1,307.4	30.2	$ 21.4	0.7	12.1	$ 107	12.2
Small electric motors	2015	132	$ 20	230.4	2,401.7	36.5	$ 43.3	293.2	2,948.9	46.5	$ 48.2	0.9	6.3	$ 272	38.2
Walk-in refrigerators and freezers	2015	2,128	$ 273	36.3	378.7	8.5	$ 6.8	79.3	797.0	18.4	$ 13.0	0.8	11.4	$ 71	8.3
Total				**6,088**	**73,003**	**1,667**	**$ 1,247**	**10,553**	**124,955**	**3,049**	**$ 2,195**			**$ 12,949**	**1,414**

Product	Emissions Reductions in 2020			Emissions Reductions in 2030[7]		
	CO2 1000 MT	NOx Tons	SO2 Tons	CO2 1000 MT	NOx Tons	SO2 Tons
Residential						
Battery chargers	383.2	329.9	1520.5	383.2	329.9	1520.5
Central AC & HP	0.2	193.2	890.5	490.5	422.2	1946.4
Clothes dryers	163.8	140.0	603.4	415.9	355.3	1531.6
(electricity)	152.1	130.9	603.3	386.0	332.2	1531.4
(gas)	11.8	9.1	0.1	29.9	23.1	0.1
Clothes washers	226.4	188.9	632.4	452.9	377.8	1264.9
Direct heaters[8]	32.9	24.7	-31.5	0.1	49.4	-63.1
External power supplies	87.1	75.0	345.6	87.1	75.0	345.6
Furnaces *(gas)*	186.4	143.8	0.9	435.0	335.6	2.1
Furnaces *(oil)*	10.4	8.0	0.05	24.3	18.8	0.1
Furnace fans	280.3	241.3	1112.3	1049.0	777.5	3584.2
Microwave ovens	74.3	64.0	294.8	399.1	67.7	312.2
Pool heaters	9.9	7.6	0.05	9.9	7.6	0.05
Refrigerators	278.9	240.0	1106.5	707.9	609.3	2808.7
Room AC	71.4	61.4	283.1	137.2	118.1	544.4
Water heaters	484.2	403.8	1288.0	861.3	718.5	2404.1
(electricity)	324.4	279.2	1287.2	605.6	521.3	2402.8
(gas)	159.8	123.3	0.8	255.7	197.3	1.3
Commercial						
Beverage vending machines	11.0	9.5	43.8	18.2	15.6	72.1
Commercial boilers	14.3	11.1	0.1	33.4	25.8	0.2
Clothes washers	36.4	29.2	52.5	45.6	36.7	66.0
Fluorescent ballasts	77.7	66.9	308.3	191.7	165.0	760.7
Fluorescent lamps	1067.1	918.5	4234.0	1067.1	918.5	4234.0
Incandescent reflector lamps	315.4	271.5	1251.3	315.4	271.5	1251.3
BR \ exempted reflector lamps	143.1	123.2	567.7	143.1	123.2	567.7
Liquid-immersed transformers	25.0	21.5	99.3	80.6	69.4	319.9
Low-voltage dry type transformers	106.9	92.1	424.3	344.6	296.6	1367.3
Metal halide lamp fixtures	191.7	165.0	760.5	540.2	464.9	2143.3
Reach-in refrigerators and freezers	33.1	28.5	131.2	88.2	75.9	349.8
Small electric motors	156.2	134.5	619.9	198.9	171.2	789.0
Walk-in refrigerators and freezers	24.6	21.2	97.7	53.7	46.3	213.3
Total	**4,492**	**4,014**	**16,637**	**8,574**	**6,943**	**28,336**

Notes:

[1] For purposes of the analyses, incremental costs for residential and commerical clothes washers are apportioned based on the individual components' contribution to overall energy consumption.

[2] Value of bill savings is based on energy savings in 2020 or 2030 and current average state energy prices. This value does not take account of the incremental cost of more efficient products.

[3] Payback period is the length of time required to recoup any increase in product cost from advances in efficiency.

[4] The benefit / cost ratio is a measure of the annual energy bill savings of an efficient product versus its incremental cost.

[5] Net present value is the total monetary value of bill savings achieved by products sold under the standards between now and 2030 minus the total incremental product cost incurred by purchasers as a result of the standards over the same period expressed in current dollars. Both costs and savings are discounted using a 5% real discount rate.

[6] The payback period and benefit / cost ratios for residential and commercial clothes washers take into account savings from the machine, water heating, and water consumption. For residential clothes washers, the two payback periods were calculated for a clothes washer utilizing electricity vs. natural gas for water heating. Benefit / cost ratios were calculated for total savings and costs (electric, natural gas, and water) as well as for clothes washers utilizing electricity vs. natural gas for water heating. For commercial clothes washers, we assume that only natural gas is used for water heating. Therefore only one payback period and benefit / cost ratio were calculated.

[7] 2030 emissions reductions for NOx and SO2 are calculated using 2020 emission factors.

[8] Negative savings for direct heaters represent the emissions generated from the incorporation of electronic ignition, a technology that is not included in the current federal standard.