U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

BUILDING TECHNOLOGIES OFFICE

State Energy-Efficient Appliance Rebate Program:

Volume 2 – Program Results

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In February 2009, President Obama signed into law the American Recovery and Reinvestment Act of 2009 (ARRA). The primary goals of this $787 billion stimulus included creating new jobs and saving existing ones, spurring economic activity and investing in long-term growth, and fostering unprecedented levels of accountability and transparency in government spending. With funding provided by ARRA, the U.S. Department of Energy (DOE) developed the State Energy-Efficient Appliance Rebate Program (SEEARP) to spur economic activity and invest in long-term energy savings by helping consumers replace older, inefficient appliances with new, efficient models. SEEARP provided almost $300 million to the 56 U.S. states and territories to support state-level consumer rebate programs for efficient appliances.

SEEARP was the first national appliance rebate program for residential consumers. Accordingly, DOE designed and built the program from scratch, working with stakeholders including state energy offices (SEOs), manufacturers of 14 major appliance, water heater, and heating, ventilation, and air conditioning (HVAC) equipment types, utilities, retailers, distributors, trade associations, and appliance recyclers.

The program included three phases: planning, implementation, and closeout. In the planning phase, DOE solicited, reviewed, and approved program plans from each of the 56 states and territories; developed technical support tools; and fostered interaction and problem solving among states and between states and other stakeholders. During the implementation phase, DOE supported states through launching their programs, provided additional tools and program promotion, and reviewed and approved more than 400 program modifications. For the closeout phase, DOE helped the states complete final rebate, budget, and narrative reports and created program impacts reports summarizing individual state and overall results.

SEEARP QUANTITATIVE ANALYSES

During SEEARP, states and territories issued consumers 1,783,425 product rebates totaling $264,325,970. Approximately 88% of rebates issued (1,575,406) were for major appliances, 10% (177,903) for HVAC, and 2% (30,116) for water heaters. Several states offered additional bonuses for recycling; they issued consumers 177,029 bonuses totaling $7,415,755. Figure 1 and Table 1 summarize the rebates and recycling bonuses paid by product category.

Figure 1 - Rebates Issued by Product

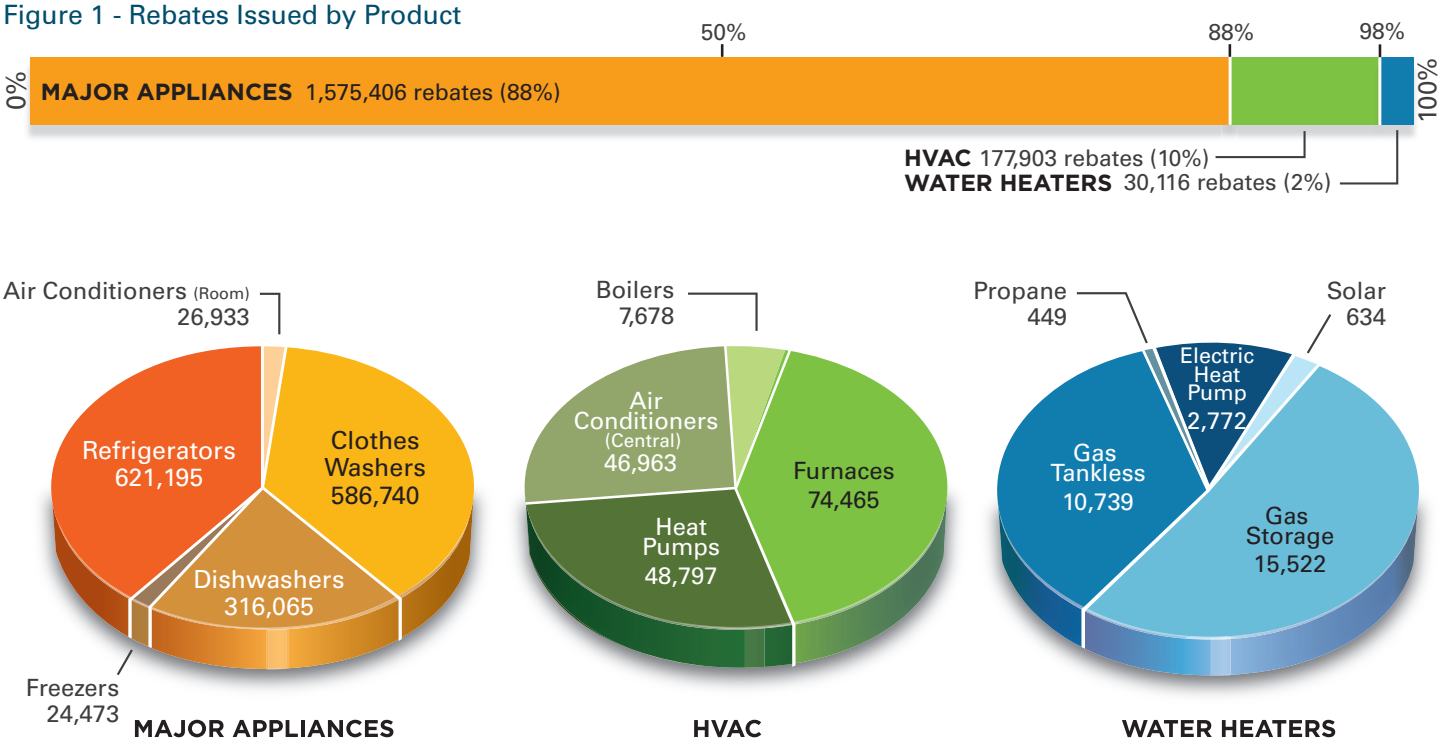

Table 1- Summary of Rebates, Recycling Bonuses and Stimulus Impacts by Product Group

	Major Appliances	HVAC	Water Heaters	All Products
Total Rebates and Percent of Total	1,575,406	177,903	30,116	1,783,425
	88%	10%	2%	100%
Rebate Payments to Consumers ($) and Percent of Total	$174,727,097	$82,732,863	$6,866,010	$264,325,970
	66%	31%	3%	100%
Total Recycling Bonuses and Percent of Total	167,897	6,924	2,208	177,029
	95%	4%	1%	100%
Recycling Bonus Payments to Consumers ($) and Percent of Total	$6,730,855	$519,300	$165,600	$7,415,755
	91%	7%	2%	100%
Consumer Spending ($) and Leveraging Ratio	$1,059,109,710	$850,018,151	$39,286,939	$1,948,414,800
	(5.1:1)	(9.3:1)	(4.7:1)	(6.4:1)
Sales Tax Leveraged ($) and Leveraging Ratio	$59,600,193	$47,716,797	$1,873,076	$109,190,066
	(0.3:1)	(0.6:1)	(0.3:1)	(0.4:1)

SEEARP gave each state the freedom to design its own program, including selecting eligible products and determining rebate levels. This resulted in 56 unique programs. While major appliances accounted for 88% of the rebates issues, those rebates represented 66% of the rebate funds paid to consumers. HVAC equipment, which accounted for 10% of the rebates, represented 31% of the total rebate funds expended. Table 2 summarizes rebate payments by product.

Table 2 - Summary of Rebates by Product

Product	Rebates by Product Type	% of Total Rebates	Rebate Payments	% of Total Rebate Payments
Major Appliances	1,575,406	88.3%	$174,727,097	66.1%
Air conditioners (Room)	26,933	1.5%	$1,972,613	0.7%
Clothes washers	586,740	32.9%	$63,300,621	23.9%
Dishwashers	316,065	17.7%	$26,791,382	10.1%
Freezers	24,473	1.4%	$2,444,311	0.9%
Refrigerators	621,195	34.8%	$80,218,170	30.3%
HVAC	177,903	10.0%	$82,732,863	31.3%
Air conditioners (Central)	46,963	2.6%	$24,264,258	9.2%
Boiler reset controls (Gas)	64	0.0%	$6,400	0.0%
Boiler reset controls (Oil)	94	0.0%	$9,400	0.0%
Boilers (Gas)	3,921	0.2%	$2,406,201	0.9%
Boilers (Oil)	3,496	0.2%	$1,531,648	0.6%
Boilers (Propane)	103	0.0%	$23,800	0.0%
Furnaces (Gas)	71,785	4.0%	$28,870,187	10.9%
Furnaces (Oil)	624	0.0%	$257,396	0.1%
Furnaces (Propane)	2,056	0.1%	$678,821	0.3%
Heat pumps (Air-source)	47,580	2.7%	$23,648,552	8.9%
Heat pumps (Ground-source)	1,217	0.1%	$1,036,200	0.4%
Water Heaters	30,116	1.7%	$6,866,010	2.6%
Water heaters (Electric heat pump)	2,772	0.2%	$1,002,201	0.4%
Water Heaters (Gas storage)	15,522	0.9%	$2,029,286	0.8%
Water heaters (Gas tankless)	10,739	0.6%	$2,910,306	1.1%
Water heaters (Propane storage)	181	0.0%	$27,045	0.0%
Water heaters (Propane tankless)	268	0.0%	$67,788	0.0%
Water heaters (Solar, electric backup)	346	0.0%	$344,983	0.1%
Water heaters (Solar, gas backup)	127	0.0%	$162,401	0.1%
Water heaters (Solar, indirect backup)	161	0.0%	$322,000	0.1%
Total	1,783,425	100%	$264,325,970	100%

Please note that because of rounding, some categories do not sum to 100%.

Four states (Illinois, New Jersey, New York, and Texas) offered recycling bonuses to ensure that the old appliances being replaced were removed from the grid and kept out of landfills. Table 3 summarizes recycling bonuses paid, by product.

Table 3 - Summary of Recycling Bonuses by Product

Product	Recycling Bonuses Paid	% of Total Recycling Bonuses	Recycling Bonus Payments	% of Total Recycling Bonus Payments
Major Appliances	167,897	95.0%	$6,730,855	91.0%
Air conditioners (Room)	213	0.0%	$15,975	0.0%
Clothes washers	69,853	39.0%	$2,221,750	30.0%
Dishwashers	12,311	7.0%	$856,980	12.0%
Freezers	4,888	3.0%	$233,700	3.0%
Refrigerators	80,632	46.0%	$3,402,450	46.0%
HVAC	6,924	4.0%	$519,300	7.0%
Air conditioners (Central)	4,203	2.0%	$315,225	4.0%
Boiler reset controls (Gas)	0	0.0%	$0	0.0%
Boiler reset controls (Oil)	0	0.0%	$0	0.0%
Boilers (Gas)	0	0.0%	$0	0.0%
Boilers (Oil)	0	0.0%	$0	0.0%
Boilers (Propane)	0	0.0%	$0	0.0%
Furnaces (Gas)	0	0.0%	$0	0.0%
Furnaces (Oil)	0	0.0%	$0	0.0%
Furnaces (Propane)	0	0.0%	$0	0.0%
Heat pumps (Air-source)	2,721	2.0%	$204,075	3.0%
Heat pumps (Ground-source)	0	0.0%	$0	0.0%
Water Heaters	2,208	1.0%	$165,600	2.0%
Water heaters (Electric peat pump)	174	0.0%	$13,050	0.0%
Water heaters (Gas storage)	1,400	1.0%	$105,000	1.0%
Water Heaters (Gas tankless)	607	0.0%	$45,525	1.0%
Water Heaters (Propane storage)	0	0.0%	$0	0.0%
Water Heaters (Propane tankless)	0	0.0%	$0	0.0%
Water Heaters (Solar, electric backup)	27	0.0%	$2,025	0.0%
Water Heaters (Solar, gas backup)	0	0.0%	$0	0.0%
Water Heaters (Solar, indirect backup)	0	0.0%	$0	0.0%
Total	177,029	100%	$7,415,755	100%

Please note that because of rounding, some categories do not sum to 100%.

DOE asked (but did not require) states to report purchase prices of the products for which consumers applied for rebates. States reported pricing for approximately 95% of rebated products. Table 4 presents rebate payments, reported consumer spending, and estimated sales tax generated, by product.

Table 4 - Summary of Reported Consumer Spending and Sales Tax Generated by Product

Product	Rebate Payments (Including Recycling Bonuses)	Reported Consumer Spending	Leveraging Ratio (Spending)	Estimated Sales Tax*	Leveraging Ratio (Sales Tax)
Major Appliances	$181,457,952	$1,059,109,710	5.1:1	$59,600,193	0.3:1
Air conditioners (Room)	$1,988,588	$7,242,044	2.7:1	$424,512	0.2:1
Clothes washers	$65,522,371	$328,607,814	4.2:1	$18,118,142	0.3:1
Dishwashers	$27,648,362	$158,641,620	4.9:1	$8,792,386	0.3:1
Freezers	$2,678,011	$10,875,188	3.4:1	$583,538	0.2:1
Refrigerators	$83,620,620	$553,743,044	5.9:1	$31,681,614	0.4:1
HVAC	$83,252,163	$850,018,151	9.3:1	$47,716,797	0.6:1
Air conditioners (Central)	$24,579,483	$287,827,508	10.9:1	$17,038,231	0.7:1
Boiler reset controls (Gas)	$6,400	$50,639	6.9:1	$0	0.0:1
Boiler reset controls (Oil)	$9,400	$71,619	6.6:1	$0	0.0:1
Boilers (Gas)	$2,406,201	$12,650,067	4.3:1	$572,928	0.2:1
Boilers (Oil)	$1,531,648	$8,062,309	4.3:1	$284,623	0.2:1
Boilers (Propane)	$23,800	$8,495	-0.6:1	$0	0.0:1
Furnaces (Gas)	$28,870,187	$238,912,389	7.3:1	$12,482,703	0.4:1
Furnaces (Oil)	$257,396	$544,189	1.1:1	$17,347	0.1:1
Furnaces (Propane)	$678,821	$4,437,853	5.5:1	$270,495	0.4:1
Heat pumps (Air-source)	$23,852,627	$286,470,000	11.1:1	$16,315,870	0.7:1
Heat pumps (Ground-source)	$1,036,200	$10,983,084	9.6:1	$734,601	0.7:1
Water Heaters	$7,031,610	$39,286,939	4.7:1	$1,873,076	0.3:1
Water Heaters (Electric heat pump)	$1,015,251	$5,030,002	4.0:1	$268,740	0.3:1
Water Heaters (Gas storage)	$2,134,286	$9,609,631	3.7:1	$489,951	0.2:1
Water Heaters (Gas tankless)	$2,955,831	$19,255,657	5.6:1	$951,630	0.3:1
Water Heaters (Propane storage)	$27,045	$57,830	1.1:1	$2,701	0.1:1
Water Heaters (Propane tankless)	$67,788	$318,287	3.7:1	$8,803	0.1:1
Water Heaters (Solar, electric backup)	$347,008	$2,368,372	5.9:1	$101,880	0.3:1
Water Heaters (Solar, gas backup)	$162,401	$1,008,029	5.2:1	$49,372	0.3:1
Water Heaters (Solar, indirect backup)	$322,000	$1,639,132	4.1:1	$0	0.0:1
All Products	$271,741,725	$1,948,414,800	6.4:1	$109,190,066	0.4:1

*Sales tax was estimated by multiplying the reported consumer spending by the appropriate state sales tax rate.

One of SEEARP's goals was to preserve natural resources by increasing the energy and water efficiency of products in consumers' homes. These resource savings also translate to lower utility bills for consumers and reduced carbon dioxide equivalent (CO2e) emissions. Tables 5-9 present estimated energy and water savings and the associated cost savings and reduced CO2e emissions, by product group and product.

Table 5 - Summary of Estimated Annual Energy and Water Savings by Product Group

	Major Appliances	HVAC	Water Heaters	All Products
Annual Consumer Energy Cost Savings ($)	$23,604,994	$17,600,479	$2,566,973	$43,772,446
	53.9%	40.2%	5.9%	—
Annual Consumer Water Cost Savings ($)	$29,721,205	—	—	$29,721,205
	100%	—	—	100%
Annual Electricity Savings (kWh)	159,928,701	71,620,329	8,219,498	239,768,527
	66.7%	29.9%	3.4%	
Annual Natural Gas Savings (therms)	2,692,609	7,950,535	1,194,274	11,837,418
	22.7%	67.2%	10.1%	
Annual Propane Savings (gallons)	—	363,501	27,594	391,095
	—	92.9%	7.1%	
Annual Oil Savings (gallons)	—	154,347	—	154,347
	—	100%	—	
Annual Energy Savings (Btu)	814,937,619,416	1,094,074,795,399	149,992,554,368	2,059,004,969,182
	39.6%	53.1%	7.3%	
Annual Water Savings (gallons)	3,962,299,019	—	—	3,962,299,019
	100%	—	—	
Annual Greenhouse Gas Emission Savings (lb CO2e)	283,958,911	224,771,821	27,960,193	536,690,926
	52.9%	41.9%	5.2%	

Table 6 - Summary of Estimated Annual Program Energy and Water Savings by Product

Product	Electricity (kWh)	Natural Gas (therms)	Heating Oil (gallons)	Propane (gallons)	Water (gallons)
Major Appliances	159,928,701	2,692,609	—	—	3,962,299,019
Air conditioners (Room)	3,352,383	—	—	—	—
Clothes washers	75,285,788	2,495,486	—	—	3,898,603,789
Dishwashers	9,418,579	197,123	—	—	63,695,230
Freezers	1,181,674	—	—	—	—
Refrigerators	70,690,276	—	—	—	—
HVAC	71,620,329	7,950,535	154,347	363,501	—
Air conditioners (Central)	21,088,614	—	—	—	—
Boiler reset controls (Gas)	—	5,502	—	—	—
Boiler reset controls (Oil)	—	—	5,554	—	—
Boilers (Gas)	—	307,230	—	—	—
Boilers (Oil)	—	—	127,285	—	—
Boilers (Propane)	—	—	—	11,344	—
Furnaces (Gas)	1,168,410	7,637,803	—	—	—
Furnaces (Oil)	17,064	—	21,509	—	—
Furnaces (Propane)	—	—	—	352,157	—
Heat pumps (Air-source)	43,435,472	—	—	—	—
Heat pumps (Ground-source)	5,910,769	—	—	—	—
Water Heaters	8,219,498	1,194,274	—	27,594	—
Water Heaters (Electric heat pump)	7,379,064	—	—	—	—
Water Heaters (Gas storage)	—	320,726	—	—	—
Water Heaters (Gas tankless)	—	836,031	—	—	—
Water Heaters (Propane storage)	—	—	—	4,750	—
Water Heaters (Propane tankless)	—	—	—	22,844	—
Water Heaters (Solar, electric backup)	840,434	—	—	—	—
Water Heaters (Solar, gas backup)	—	16,544	—	—	—
Water Heaters (Solar, indirect backup)	—	20,973	—	—	—
All Products	239,768,527	11,837,418	154,347	391,095	3,962,299,019

Table 7 - Summary of Estimated Annual Energy Savings by Product

Product	Electricity (Btu)	Natural Gas (Btu)	Heating Oil (Btu)	Propane (Btu)	Total All Fuels (Btu)
Major Appliances	545,676,726,702	269,260,892,714	—	—	814,937,619,416
Air conditioners (Room)	11,438,331,406	—	—	—	11,438,331,406
Clothes washers	256,875,109,786	249,548,635,626	—	—	506,423,745,412
Dishwashers	32,136,192,863	19,712,257,088	—	—	51,848,449,951
Freezers	4,031,871,688	—	—	—	4,031,871,688
Refrigerators	241,195,220,959	—	—	—	241,195,220,959
HVAC	244,368,561,798	795,053,471,877	21,454,236,998	33,198,524,725	1,094,074,795,399
Air conditioners (Central)	71,954,349,974	—	—	—	71,954,349,974
Boiler reset controls (Gas)	—	550,172,985	—	—	550,172,985
Boiler reset controls (Oil)	—	—	771,962,963	—	771,962,963
Boilers (Gas)	—	30,723,047,928	—	—	30,723,047,928
Boilers (Oil)	—	—	17,692,569,682	—	17,692,569,682
Boilers (Propane)	—	—	—	1,036,014,145	1,036,014,145
Furnaces (Gas)	3,986,614,920	763,780,250,965	—	—	767,766,865,885
Furnaces (Oil)	58,222,368	—	2,989,704,353	—	3,047,926,721
Furnaces (Propane)	—	—	—	32,162,510,580	32,162,510,580
Heat Pumps (Air-source)	148,201,831,004	—	—	—	148,201,831,004
Heat Pumps (Ground-source)	20,167,543,532	—	—	—	20,167,543,532
Water Heaters	28,044,927,176	119,427,448,616	—	2,520,178,576	149,992,554,368
Water Heaters (Electric heat pump)	25,177,366,368	—	—	—	25,177,366,368
Water Heaters (Gas storage)	—	32,072,557,616	—	—	32,072,557,616
Water Heaters (Gas tankless)	—	83,603,115,000	—	—	83,603,115,000
Water Heaters (Propane storage)	—	—	—	433,798,576	433,798,576
Water Heaters (Propane tankless)	—	—	—	2,086,380,000	2,086,380,000
Water Heaters (Solar, electric backup)	2,867,560,808	—	—	—	2,867,560,808
Water Heaters (Solar, gas backup)	—	1,654,429,000	—	—	1,654,429,000
Water Heaters (Solar, indirect backup)	—	2,097,347,000	—	—	2,097,347,000
All Products	582,155,878,355	942,265,060,742	21,454,236,998	35,718,703,301	1,581,593,879,396

Table 8 - Summary of Estimated Annual Energy Cost Savings by Product

Product	Electricity	Natural Gas	Heating Oil	Propane	Energy
Major Appliances	$20,480,890	$3,124,104	—	—	$23,604,994
Air conditioners (Room)	$512,233	—	—	—	$512,233
Clothes washers	$9,170,785	$2,885,961	—	—	$12,056,746
Dishwashers	$1,114,739	$238,143	—	—	$1,352,882
Freezers	$150,523	—	—	—	$150,523
Refrigerators	$9,532,610	—	—	—	$9,532,610
HVAC	$7,760,789	$8,729,137	$430,174	$680,380	$17,600,479
Air conditioners (Central)	$2,572,068	—	—	—	$2,572,068
Boiler reset controls (Gas)	—	$8,564	—	—	$8,564
Boiler reset controls (Oil)	—	—	$15,495	—	$15,495
Boilers (Gas)	—	$397,629	—	—	$397,629
Boilers (Oil)	—	—	$355,066	—	$355,066
Boilers (Propane)	—	—	—	$21,799	$21,799
Furnaces (Gas)	$140,647	$8,322,944	—	—	$8,463,590
Furnaces (Oil)	$2,809	—	$59,613	—	$62,422
Furnaces (Propane)	—	—	—	$658,580	$658,580
Heat pumps (Air-source)	$4,490,846	—	—	—	$4,490,846
Heat pumps (Ground-source)	$554,419	—	—	—	$554,419
Water Heaters	$959,852	$1,547,867	—	$59,253	$2,566,973
Water Heaters (Electric heat pump)	$855,949	—	—	—	$855,949
Water Heaters (Gas storage)	—	$366,485	—	—	$366,485
Water Heaters (Gas tankless)	—	$1,130,636	—	—	$1,130,636
Water Heaters (Propane storage)	—	—	—	$9,155	$9,155
Water Heaters (Propane tankless)	—	—	—	$50,098	$50,098
Water Heaters (Solar, electric backup)	$103,903	—	—	—	$103,903
Water Heaters (Solar, gas backup)	—	$18,099	—	—	$18,099
Water Heaters (Solar, indirect backup)	—	$32,648	—	—	$32,648
All Products	$29,201,531	$13,401,108	$430,174	$739,633	$43,772,446

Table 9 - Summary of Annual Program Energy and Water Cost Savings by Product

Product	Energy	Water	Total
Major Appliances	$23,604,994	$29,721,205	$53,326,199
Air conditioners (Room)	$512,233	—	$512,233
Clothes washers	$12,056,746	$29,243,427	$41,300,173
Dishwashers	$1,352,882	$477,778	$1,830,660
Freezers	$150,523	—	$150,523
Refrigerators	$9,532,610	—	$9,532,610
HVAC	$17,600,479	—	$17,600,479
Air conditioners (Central)	$2,572,068	—	$2,572,068
Boiler reset controls (Gas)	$8,564	—	$8,564
Boiler reset controls (Oil)	$15,495	—	$15,495
Boilers (Gas)	$397,629	—	$397,629
Boilers (Oil)	$355,066	—	$355,066
Boilers (Propane)	$21,799	—	$21,799
Furnaces (Gas)	$8,463,590	—	$8,463,590
Furnaces (Oil)	$62,422	—	$62,422
Furnaces (Propane)	$658,580	—	$658,580
Heat Pumps (Air-source)	$4,490,846	—	$4,490,846
Heat Pumps (Ground-source)	$554,419	—	$554,419
Water Heaters	$2,566,973	—	$2,566,973
Water Heaters (Electric heat pump)	$855,949	—	$855,949
Water Heaters (Gas storage)	$366,485	—	$366,485
Water Heaters (Gas tankless)	$1,130,636	—	$1,130,636
Water Heaters (Propane storage)	$9,155	—	$9,155
Water Heaters (Propane tankless)	$50,098	—	$50,098
Water Heaters (Solar, electric backup)	$103,903	—	$103,903
Water Heaters (Solar, gas backup)	$18,099	—	$18,099
Water Heaters (Solar, indirect backup)	$32,648	—	$32,648
All Products	$43,772,446	$29,721,205	$73,493,651

Table 10 summarizes the estimated CO2e emission savings from the reduced energy use of the rebated products, by fuel type.

Table 10 - Summary of Estimated Annual Carbon Dioxide Equivalent (CO2e) Emission Savings by Product

Product	Electricity (lb)	Natural Gas (lb)	Heating Oil (lb)	Propane (lb)	Total All Fuels (lb)
Major Appliances	252,463,465	31,495,447	—	—	283,958,911
Air conditioners (Room)	5,307,542	—	—	—	5,307,542
Clothes washers	121,028,200	29,189,704	—	—	150,217,904
Dishwashers	15,552,685	2,305,743	—	—	17,858,428
Freezers	2,012,404	—	—	—	2,012,404
Refrigerators	108,562,633	—	—	—	108,562,633
HVAC	123,801,006	92,997,405	3,481,464	4,491,946	224,771,821
Air conditioners (Central)	32,386,847	—	—	—	32,386,847
Boiler reset controls (Gas)	—	64,354	—	—	64,354
Boiler reset controls (Oil)	—	—	125,269	—	125,269
Boilers (Gas)	—	3,593,675	—	—	3,593,675
Boilers (Oil)	—	—	2,871,043	—	2,871,043
Boilers (Propane)	—	—	—	140,179	140,179
Furnaces (Gas)	1,980,272	89,339,376	—	—	91,319,648
Furnaces (Oil)	23,359	—	485,151	—	508,510
Furnaces (Propane)	—	—	—	4,351,767	4,351,767
Heat pumps (Air-source)	77,111,579	—	—	—	77,111,579
Heat pumps (Ground-source)	12,298,950	—	—	—	12,298,950
Water Heaters	13,649,770	13,969,429	—	340,994	27,960,193
Water Heaters (Electric heat pump)	12,528,387	—	—	—	12,528,387
Water Heaters (Gas storage)	—	3,751,527	—	—	3,751,527
Water Heaters (Gas tankless)	—	9,779,056	—	—	9,779,056
Water Heaters (Propane storage)	—	—	—	58,695	58,695
Water Heaters (Propane tankless)	—	—	—	282,299	282,299
Water Heaters (Solar, electric backup)	1,121,383	—	—	—	1,121,383
Water Heaters (Solar, gas backup)	—	193,519	—	—	193,519
Water Heaters (Solar, indirect backup)	—	245,327	—	—	245,327
All Products	389,914,242	138,462,280	3,481,464	4,832,940	536,690,926

Table 11 lists the average product lifetimes DOE used to calculate lifetime savings and impacts.

Table 11 - Summary of Average Product Lifetimes

Product	Product Lifetime (years)
Major Appliances	
Air conditioners (Room)	9
Clothes washers	11
Dishwashers	10
Freezers	11
Refrigerators	12
HVAC	
Air conditioners (Central)	11
Boiler reset controls (Gas)	20
Boiler reset controls (Oil)	20
Boilers (Gas)	20
Boilers (Oil)	20
Boilers (Propane)	20
Furnaces (Gas)	15
Furnaces (Oil)	17
Furnaces (Propane)	15
Heat pumps (Air-source)	12
Heat pumps (Ground-source)	15
Water Heaters	
Water Heaters (Electric heat pump)	10
Water Heaters (Gas storage)	11
Water Heaters (Gas tankless)	20
Water Heaters (Propane storage)	11
Water Heaters (Propane tankless)	20
Water Heaters (Solar, electric backup)	20
Water Heaters (Solar, gas backup)	20
Water Heaters (Solar, indirect backup)	20

Using estimates of annual savings and product lifetimes, DOE estimated lifetime energy and water savings, consumer utility bill savings, and reductions in greenhouse gas emissions. Tables 12-17 present estimated lifetime savings of the products rebated during SEEARP.

Table 12 - Summary of Estimated Lifetime Energy and Water Savings by Product Group

	Major Appliances	HVAC	Water Heaters	All Products
Consumer Energy Cost Savings ($)	$266,810,200	$244,363,987	$39,399,195	$550,573,383
	48%	44%	7%	
Consumer Water Cost Savings ($)	$326,455,476	—	—	$326,455,476
	100%	—	—	
Electricity Savings (kWh)	1,813,782,637	859,678,188	90,599,320	2,764,060,146
	66%	31%	3%	
Natural Gas Savings (therms)	29,421,576	120,821,682	20,998,960	171,242,217
	17%	71%	12%	
Propane Savings (gallons)	—	5,509,230	509,136	6,018,366
	—	92%	8%	
Oil Savings (gallons)	—	3,022,415	—	3,022,415
	—	100%	—	
Energy Savings (Btu)	9,130,783,921,769	15,938,663,730,023	2,455,520,217,951	27,524,967,869,742
	33%	58%	9%	
Water Savings (gallons)	43,521,593,977	—	—	43,521,593,977
	100%	—	—	
Greenhouse Gas Emission Savings (lb CO2e)	3,203,637,145	3,045,684,808	399,627,996	6,648,949,948
	48%	46%	6%	

Table 13 - Summary of Estimated Lifetime Program Energy and Water Savings by Product (Units)

Product	Electricity (kWh)	Natural Gas (therms)	Heating Oil (gallons)	Propane (gallons)	Water (gallons)
Major Appliances	1,813,782,637	29,421,576	—	—	43,521,593,977
Air conditioners (Room)	30,171,449	—	—	—	—
Clothes washers	828,143,672	27,450,350	—	—	42,884,641,680
Dishwashers	94,185,794	1,971,226	—	—	636,952,298
Freezers	12,998,414	—	—	—	—
Refrigerators	848,283,309	—	—	—	—
HVAC	859,678,188	120,821,682	3,022,415	5,509,230	—
Air conditioners (Central)	231,974,751	—	—	—	—
Boiler reset controls (Gas)	—	110,035	—	—	—
Boiler reset controls (Oil)	—	—	111,074	—	—
Boilers (Gas)	—	6,144,610	—	—	—
Boilers (Oil)	—	—	2,545,693	—	—
Boilers (Propane)	—	—	—	226,873	—
Furnaces (Gas)	17,526,150	114,567,038	—	—	—
Furnaces (Oil)	290,088	—	365,647	—	—
Furnaces (Propane)	—	—	—	5,282,357	—
Heat pumps (Air-source)	521,225,666	—	—	—	—
Heat pumps (Ground-source)	88,661,534	—	—	—	—
Water Heaters	90,599,320	20,998,960	—	509,136	—
Water Heaters (Electric heat pump)	73,790,640	—	—	—	—
Water Heaters (Gas storage)	—	3,527,981	—	—	—
Water Heaters (Gas tankless)	—	16,720,623	—	—	—
Water Heaters (Propane storage)	—	—	—	52,248	—
Water Heaters (Propane tankless)	—	—	—	456,888	—
Water Heaters (Solar, electric backup)	16,808,680	—	—	—	—
Water Heaters (Solar, gas backup)	—	330,886	—	—	—
Water Heaters (Solar, indirect backup)	—	419,469	—	—	—
All Products	2,764,060,146	171,242,217	3,022,415	6,018,366	43,521,593,977

Table 14 - Summary of Estimated Lifetime Program Energy Savings by Product

Product	Electricity (Btu)	Natural Gas (Btu)	Heating Oil (Btu)	Propane (Btu)	Total All Fuels (Btu)
Major Appliances	3,593,348,648,476	285,913,285,650	—	—	3,879,261,934,125
Air conditioners (Room)	102,944,982,652	—	—	—	102,944,982,652
Clothes washers	230,348,497,116	88,790,714,772	—	—	319,139,211,888
Dishwashers	321,361,928,632	197,122,570,878	—	—	518,484,499,509
Freezers	44,350,588,568	—	—	—	44,350,588,568
Refrigerators	2,894,342,651,507	—	—	—	2,894,342,651,507
HVAC	2,933,221,978,801	12,082,168,182,725	420,115,626,894	503,157,941,603	15,938,663,730,023
Air conditioners (Central)	791,497,849,718	—	—	—	791,497,849,718
Boiler reset controls (Gas)	—	11,003,459,695	—	—	11,003,459,695
Boiler reset controls (Oil)	—	—	15,439,259,259	—	15,439,259,259
Boilers (Gas)	—	614,460,958,560	—	—	614,460,958,560
Boilers (Oil)	—	—	353,851,393,642	—	353,851,393,642
Boilers (Propane)	—	—	—	20,720,282,898	20,720,282,898
Furnaces (Gas)	59,799,223,800	11,456,703,764,471	—	—	11,516,502,988,271
Furnaces (Oil)	989,780,256	—	50,824,973,993	—	51,814,754,249
Furnaces (Propane)	—	—	—	482,437,658,705	482,437,658,705
Heat Pumps (Air-source)	1,778,421,972,052	—	—	—	1,778,421,972,052
Heat Pumps (Ground-source)	302,513,152,975	—	—	—	302,513,152,975
Water Heaters	309,124,879,840	2,099,895,953,778	—	46,499,384,333	2,455,520,217,951
Water Heaters (Electric heat pump)	251,773,663,680	—	—	—	251,773,663,680
Water Heaters (Gas storage)	—	352,798,133,778	—	—	352,798,133,778
Water Heaters (Gas tankless)	—	1,672,062,300,000	—	—	1,672,062,300,000
Water Heaters (Propane storage)	—	—	—	4,771,784,333	4,771,784,333
Water Heaters (Propane tankless)	—	—	—	41,727,600,000	41,727,600,000
Water Heaters (Solar, electric backup)	57,351,216,160	—	—	—	57,351,216,160
Water Heaters (Solar, gas backup)	—	33,088,580,000	—	—	33,088,580,000
Water Heaters (Solar, indirect backup)	—	41,946,940,000	—	—	41,946,940,000
All Products	6,835,695,507,116	14,467,977,422,153	420,115,626,894	549,657,325,936	22,273,445,882,099

Table 15 - Summary of Estimated Lifetime Program Energy Cost Savings by Product

Product	Electricity	Natural Gas	Heating Oil	Propane	Total All Fuels
Major Appliances	$232,683,195	$34,127,005	—	—	$266,810,200
Air conditioners (Room)	$4,610,095	—	—	—	$4,610,095
Clothes washers	$100,878,636	$31,745,574	—	—	$132,624,210
Dishwashers	$11,147,391	$2,381,431	—	—	$13,528,822
Freezers	$1,655,758	—	—	—	$1,655,758
Refrigerators	$114,391,315	—	—	—	$114,391,315
HVAC	$92,656,635	$132,968,017	$8,424,645	$10,314,691	$244,363,987
Air conditioners (Central)	$28,292,752	—	—	—	$28,292,752
Boiler reset controls (Gas)	—	$171,281	—	—	$171,281
Boiler reset controls (Oil)	—	—	$309,896	—	$309,896
Boilers (Gas)	—	$7,952,578	—	—	$7,952,578
Boilers (Oil)	—	—	$7,101,325	—	$7,101,325
Boilers (Propane)	—	—	—	$435,988	$435,988
Furnaces (Gas)	$2,109,699	$124,844,157	—	—	$126,953,857
Furnaces (Oil)	$47,754	—	$1,013,424	—	$1,061,178
Furnaces (Propane)	—	—	—	$9,878,703	$9,878,703
Heat pumps (Air-source)	$53,890,151	—	—	—	$53,890,151
Heat pumps (Ground-source)	$8,316,279	—	—	—	$8,316,279
Water Heaters	$10,637,548	$27,658,981	—	$1,102,666	$39,399,195
Water Heaters (Electric heat pump)	$8,559,494	—	—	—	$8,559,494
Water Heaters (Gas storage)	—	$4,031,331	—	—	$4,031,331
Water Heaters (Gas tankless)	—	$22,612,721	—	—	$22,612,721
Water Heaters (Propane storage)	—	—	—	$100,710	$100,710
Water Heaters (Propane tankless)	—	—	—	$1,001,956	$1,001,956
Water Heaters (Solar, electric backup)	$2,078,054	—	—	—	$2,078,054
Water Heaters (Solar, gas backup)	—	$361,977	—	—	$361,977
Water Heaters (Solar, indirect backup)	—	$652,951	—	—	$652,951
All Products	$335,977,378	$194,754,003	$8,424,645	$11,417,357	$550,573,383

Table 16 - Summary of Estimated Lifetime Program Energy and Water Cost Savings by Product

Product	Energy	Water	Total
Major Appliances	$266,810,200	$326,455,476	$593,265,676
Air conditioners (Room)	$4,610,095	—	$4,610,095
Clothes washers	$132,624,210	$321,677,697	$454,301,907
Dishwashers	$13,528,822	$4,777,779	$18,306,601
Freezers	$1,655,758	—	$1,655,758
Refrigerators	$114,391,315	—	$114,391,315
HVAC	$244,363,987	—	$244,363,987
Air conditioners (Central)	$28,292,752	—	$28,292,752
Boiler reset controls (Gas)	$171,281	—	$171,281
Boiler reset controls (Oil)	$309,896	—	$309,896
Boilers (Gas)	$7,952,578	—	$7,952,578
Boilers (Oil)	$7,101,325	—	$7,101,325
Boilers (Propane)	$435,988	—	$435,988
Furnaces (Gas)	$126,953,857	—	$126,953,857
Furnaces (Oil)	$1,061,178	—	$1,061,178
Furnaces (Propane)	$9,878,703	—	$9,878,703
Heat pumps (Air-source)	$53,890,151	—	$53,890,151
Heat pumps (Ground-source)	$8,316,279	—	$8,316,279
Water Heaters	$39,399,195	—	$39,399,195
Water Heaters (Electric heat pump)	$8,559,494	—	$8,559,494
Water Heaters (Gas storage)	$4,031,331	—	$4,031,331
Water Heaters (Gas tankless)	$22,612,721	—	$22,612,721
Water Heaters (Propane storage)	$100,710	—	$100,710
Water Heaters (Propane tankless)	$1,001,956	—	$1,001,956
Water Heaters (Solar, electric backup)	$2,078,054	—	$2,078,054
Water Heaters (Solar, gas backup)	$361,977	—	$361,977
Water Heaters (Solar, indirect backup)	$652,951	—	$652,951
All Products	$550,573,383	$326,455,476	$877,028,859

Table 17 - Summary of Estimated Lifetime Program Carbon Dioxide Equivalent (CO2e) Emission Savings (Due to Reduced Energy Consumption) by Product

Product	Electricity (lb)	Natural Gas (lb)	Heating Oil (lb)	Propane (lb)	Total All Fuels (lb)
Major Appliances	2,859,492,975	344,144,170	—	—	3,203,637,145
Air conditioners (Room)	47,767,879	—	—	—	47,767,879
Clothes washers	1,331,310,203	321,086,743	—	—	1,652,396,946
Dishwashers	155,526,854	23,057,427	—	—	178,584,281
Freezers	22,136,445	—	—	—	22,136,445
Refrigerators	1,302,751,593	—	—	—	1,302,751,593
HVAC	1,496,179,689	1,413,251,212	68,173,825	68,080,081	3,045,684,808
Air conditioners (Central)	356,255,312	—	—	—	356,255,312
Boiler reset controls (Gas)	—	1,287,075	—	—	1,287,075
Boiler reset controls (Oil)	—	—	2,505,390	—	2,505,390
Boilers (Gas)	—	71,873,498	—	—	71,873,498
Boilers (Oil)	—	—	57,420,866	—	57,420,866
Boilers (Propane)	—	—	—	2,803,570	2,803,570
Furnaces (Gas)	29,704,085	1,340,090,639	—	—	1,369,794,724
Furnaces (Oil)	397,098	—	8,247,570	—	8,644,667
Furnaces (Propane)	—	—	—	65,276,511	65,276,511
Heat pumps (Air-source)	925,338,950	—	—	—	925,338,950
Heat pumps (Ground-source)	184,484,246	—	—	—	184,484,246
Water Heaters	147,711,539	245,624,830	—	6,291,627	399,627,996
Water Heaters (Electric heat pump)	125,283,870	—	—	—	125,283,870
Water Heaters (Gas storage)	—	41,266,798	—	—	41,266,798
Water Heaters (Gas tankless)	—	195,581,127	—	—	195,581,127
Water Heaters (Propane storage)	—	—	—	645,649	645,649
Water Heaters (Propane tankless)	—	—	—	5,645,977	5,645,977
Water Heaters (Solar, electric backup)	22,427,669	—	—	—	22,427,669
Water Heaters (Solar, gas backup)	—	3,870,371	—	—	3,870,371
Water Heaters (Solar, indirect backup)	—	4,906,534	—	—	4,906,534
All Products	4,503,384,203	2,003,020,212	68,173,825	74,371,708	6,648,949,948

Because SEEARP was primarily an economic stimulus program, DOE did not require states to consider cost-effectiveness in designing their programs. Nonetheless, energy and cost savings over the lifetime of the new products will be significantly greater than the rebate payments issued. Table 18 presents savings per rebate $ spent by product.

Table 18 - Savings per Rebate $ Spent

Product	Annual Btu Savings per Rebate $	Cost to Generate $1 in Annual Consumer Energy Cost Savings	Lifetime Btu Savings per Rebate $	Cost to Generate $1 in Lifetime Consumer Energy Cost Savings
Major Appliances	4,491	$3.40	50,319	$0.31
Air conditioners (Room)	5,752	$3.88	51,768	$0.43
Clothes washers	7,729	$5.43 / $1.59*	85,019	$0.49 / $0.14*
Dishwashers	1,875	$20.44 / $15.1*	18,753	$2.04 / $1.51*
Freezers	1,506	$17.79	16,561	$1.62
Refrigerators	2,884	$8.77	34,613	$0.73
HVAC	13,142	$4.73	191,450	$0.34
Air conditioners (Central)	2,927	$9.56	32,202	$0.87
Boiler reset controls (Gas)	85,965	$0.75	1,719,291	$0.04
Boiler reset controls (Oil)	82,124	$0.61	1,642,474	$0.03
Boilers (Gas)	12,768	$6.05	255,366	$0.30
Boilers (Oil)	11,551	$4.31	231,027	$0.22
Boilers (Propane)	43,530	$1.09	870,600	$0.05
Furnaces (Gas)	26,594	$3.41	398,906	$0.23
Furnaces (Oil)	11,841	$4.12	201,303	$0.24
Furnaces (Propane)	47,380	$1.03	710,699	$0.07
Heat pumps (Air-source)	6,213	$5.31	74,559	$0.44
Heat pumps (Ground-source)	19,463	$1.87	291,945	$0.12
Water Heaters	21,331	$2.74	349,212	$0.18
Water Heaters (Electric heat pump)	24,799	$1.19	247,992	$0.12
Water Heaters (Gas storage)	15,027	$5.82	165,300	$0.53
Water Heaters (Gas tankless)	28,284	$2.61	565,683	$0.13
Water Heaters (Propane storage)	16,040	$2.95	176,437	$0.27
Water Heaters (Propane tankless)	30,778	$1.35	615,562	$0.07
Water Heaters (Solar, electric backup)	8,264	$3.34	165,273	$0.17
Water Heaters (Solar, gas backup)	10,187	$8.97	203,747	$0.45
Water Heaters (Solar, indirect backup)	6,514	$9.86	130,270	$0.49
All Products	7,577	$3.70	101,291	$0.31

*Note: For Clothes Washers and Dishwashers, two values are provided. The first value excludes water savings, and the second includes water savings.

DOE limited state SEEARP program administrative spending to 20% of the federal funding. Every state complied, with the highest administrative spending at 16% of federal funding and the lowest at 0%. Figure 2 presents administrative spending performance and table 19 presents spending for administration and rebates by state.

Figure 2 - Administrative Spending Performance

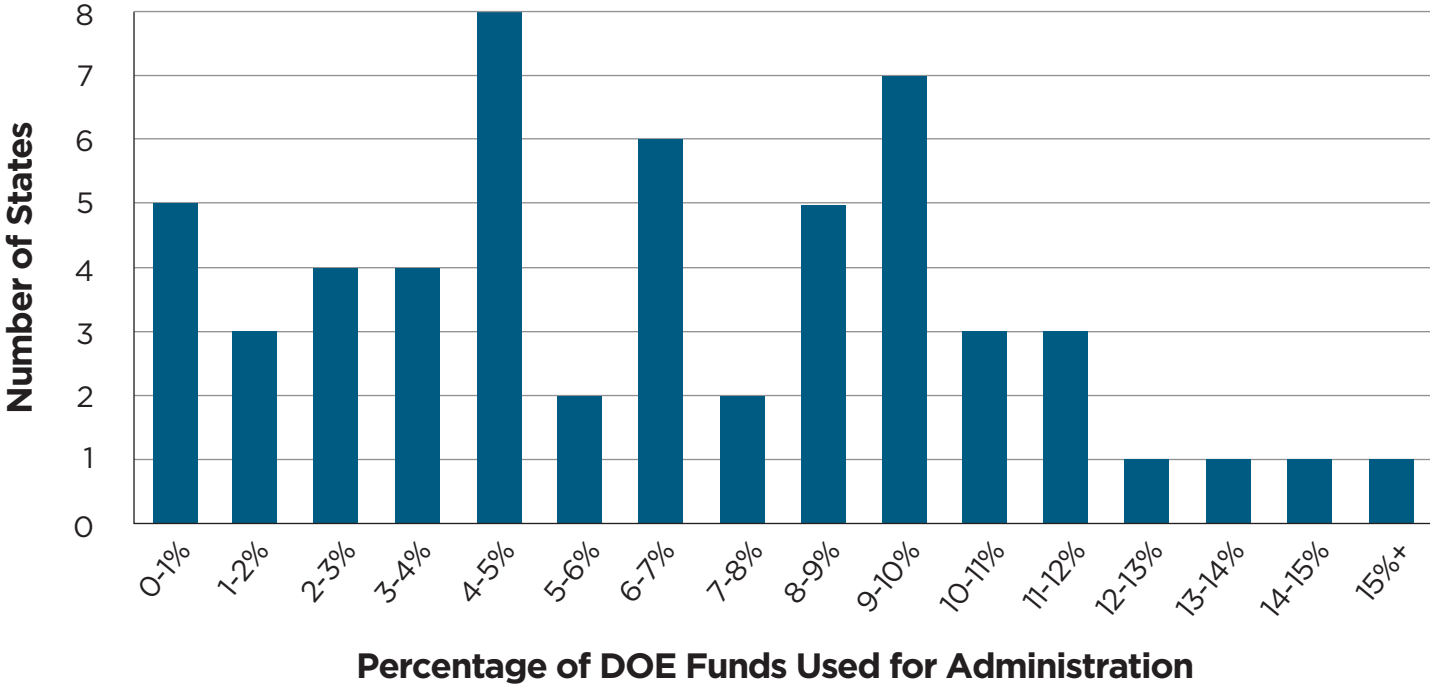

Table 19 - Federal Funds Spending by State

DOE FUNDS						
State	Budget	Administrative Spending	Rebate Payments	Amount Not Spent	% Administrative	% Rebates
AK	$658,000	$0	$643,011	$14,989	0%	100%
AL	$4,473,000	$372,000	$4,101,000	$0	8%	92%
AR	$2,740,000	$60,900	$2,679,100	$0	2%	98%
AS	$100,000	$16,425	$83,575	$0	16%	84%
AZ	$6,237,000	$166,874	$6,070,126	$0	3%	97%
CA	$35,267,000	$1,749,850	$33,517,150	$0	5%	95%
CO	$4,739,000	$328,999	$4,410,000	$1	7%	93%
CT	$3,359,000	$255,583	$3,103,417	$0	8%	92%
DC	$568,000	$49,040	$322,546	$196,414	13%	87%
DE	$838,000	$2,500	$840,469	$31	0%	100%
FL	$17,585,000	$64,921	$17,514,101	$5,979	0%	100%
GA	$9,293,000	$376,945	$8,916,055	$0	4%	96%
GU	$166,000	$0	$166,000	$0	0%	100%
HI	$1,236,000	$151,557	$1,084,250	$193	12%	88%
IA	$2,881,000	$129,510	$2,751,490	$0	4%	96%
ID	$1,462,000	$120,756	$1,255,225	$86,019	9%	91%
IL	$12,379,000	$553,293	$11,825,707	$0	4%	96%
IN	$6,118,000	$177,150	$5,940,850	$0	3%	97%
KS	$2,689,000	$89,000	$2,595,304	$4,696	3%	97%
KY	$4,096,000	$248,200	$3,847,800	$0	6%	94%
LA	$4,232,000	$423,050	$3,808,871	$79	10%	90%
MA	$6,235,000	$569,633	$5,665,367	$0	9%	91%
MD	$5,405,000	$594,425	$4,810,575	$0	11%	89%
ME	$1,263,000	$121,700	$1,141,300	$0	10%	90%
MI	$9,598,000	$1,075,456	$8,422,371	$100,173	11%	89%
MN	$5,009,000	$312,327	$4,690,400	$6,273	6%	94%
MO	$5,672,000	$511,280	$4,948,350	$212,370	9%	91%
MP	$90,000	$7,744	$87,669	-$5,413	8%	92%
MS	$2,820,000	$248,775	$2,571,225	$0	9%	91%
MT	$928,000	$87,260	$840,740	$0	9%	91%
NC	$8,849,000	$610,318	$8,238,682	$2	7%	93%
ND	$615,000	$37,800	$577,200	$0	6%	94%
NE	$1,711,000	$152,382		$0	9%	0%
NH	$1,262,000	$56,182	$1,204,000	$1,818	4%	96%
NJ	$8,331,000	$0	$8,331,000	$0	0%	100%
NM	$1,904,000	$189,000	$1,715,000	$0	10%	90%
NV	$2,495,000	$110,185	$2,384,810	$0	4%	96%
NY	$18,700,000	$2,111,623	$16,579,975	$8,403	11%	89%

Table 19 - Federal Funds Spending by State (cont.)

DOE FUNDS						
State	Budget	Administrative Spending	Rebate Payments	Amount Not Spent	% Administrative	% Rebates
OH	$11,020,000	$346,738	$9,912,143	$761,119	3%	97%
OK	$3,495,000	$248,668	$3,235,353	$10,979	7%	93%
OR	$3,636,000	$40,316	$3,593,884	$1,799	1%	99%
PA	$11,944,000	$606,711	$11,309,740	$27,513	5%	95%
PR	$3,794,000	$122,891	$3,387,708	$283,401	4%	96%
RI	$1,008,000	$141,200	$866,800	$0	14%	86%
SC	$4,298,000	$474,988	$3,755,793	$67,219	11%	89%
SD	$772,000	$21,853	$748,175	$1,972	3%	97%
TN	$5,963,000	$95,198	$5,262,401	$605,401	2%	98%
TX	$23,341,000	$1,136,664	$22,204,335	$1	5%	95%
UT	$2,626,000	$262,600	$2,363,400	$4,095	10%	90%
VA	$7,454,000	$452,245	$7,001,755	$0	6%	94%
VI	$104,000	$2,063	$101,937	$0	2%	98%
VT	$596,000	$22,158	$573,842	$0	4%	96%
WA	$6,284,000	$676,600	$5,607,400	$0	11%	89%
WI	$5,400,000	$262,540	$5,137,460	$0	5%	95%
WV	$1,741,000	$91,208	$1,649,790	$2	5%	95%
WY	$511,000	$51,035	$459,950	$15	10%	90%
All States	$295,990,000	$17,188,319	$274,856,581	$2,395,540	6%	94%

Many states partnered with retailers, distributors, manufacturers, utilities, and other stakeholders to leverage in-kind contributions. Such partnerships enabled states to benefit from marketing, advertising, and other assistance, while keeping administrative spending down. Table 20 presents administrative and in-kind spending by state.

Table 20 - Other Spending by State

OTHER FUNDS		
State	State Administrative	In-Kind
AK	$0	$0
AL	$6,963	$393,182
AR	$107,978	$0
AS	$0	$21,000
AZ	$26,400	$579,950
CA	$0	$5,570,266
CO	$51,727	$278,525
CT	$59,991	$198,222
DC	$0	$49,040
DE	$206,374	$0
FL	$0	$1,374,607
GA	$0	$464,700
GU	$0	$0
HI	$0	$168,496
IA	$134,787	$0
ID	$0	$179,023
IL	$569,445	$0
IN	$310,150	$0
KS	$179,345	$0
KY	$16,592	$393,414
LA	$423,350	$0
MA	$300,000	$410,000
MD	$612,122	$0
ME	$123,079	$39,083
MI	$124,734	$960,554
MN	$0	$410,032
MO	$38,483	$478,831
MP	$10,593	$0

OTHER FUNDS		
State	State Administrative	In-Kind
MS	$3,323	$341,770
MT	$0	$118,774
NC	$0	$689,546
ND	$32,947	$27,500
NE	$98,232	$54,150
NH	$0	$56,509
NJ	$0	$0
NM	$0	$806,500
NV	$0	$166,071
NY	$2,546,440	$0
OH	$0	$532,014
OK	$0	$323,130
OR	$0	$132,879
PA	$105,473	$1,268,279
PR	$0	$189,688
RI	$26,061	$125,250
SC	$0	$474,988
SD	$21,853	$0
TN	$261	$1,492,352
TX	$0	$1,702,059
UT	$0	$262,600
VA	$54,966	$597,137
VI	$20,258	$0
VT	$25,549	$0
WA	$0	$937,752
WI	$324,652	$3,046
WV	$217,999	$82,652
WY	$0	$63,318
All States	$6,780,126	$22,416,889

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