

Appendix F: Effect of HEEUP on household energy consumption

Appendix F1

Home Type

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	House	103	32.5	74.6	74.6
		Unit or Flat	35	11.0	25.4	100.0
		Total	138	43.5	100.0	
	Missing	System	179	56.5		
	Total		317	100.0		
Gas	Valid	House	90	33.8	78.9	78.9
		Unit or Flat	24	9.0	21.1	100.0
		Total	114	42.9	100.0	
	Missing	System	152	57.1		
	Total		266	100.0		

Home ownership status

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	Owned or mortgaged	254	80.1	95.5	95.5
		Community Housing	12	3.8	4.5	100.0
		Total	266	83.9	100.0	
	Missing	System	51	16.1		
	Total		317	100.0		
Gas	Valid	Owned or mortgaged	219	82.3	96.5	96.5
		Community Housing	8	3.0	3.5	100.0
		Total	227	85.3	100.0	
	Missing	System	39	14.7		
	Total		266	100.0		

Home Age

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	< 10 years	12	3.8	4.2	4.2
		10 to 20 years	33	10.4	11.6	15.8
		> 20 years	239	75.4	84.2	100.0
		Total	284	89.6	100.0	
Missing	System	33	10.4			
Total			317	100.0		
Gas	Valid	< 10 years	13	4.9	5.6	5.6
		10 to 20 years	32	12.0	13.7	19.2
		> 20 years	189	71.1	80.8	100.0
		Total	234	88.0	100.0	
Missing	System	32	12.0			
Total			266	100.0		

Number of household occupants

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	Single persons	101	31.9	32.2	32.2
		Two persons	122	38.5	38.9	71.0
		Three persons	43	13.6	13.7	84.7
		Four persons	17	5.4	5.4	90.1
		Five or more p.	31	9.8	9.9	100.0
		Total	314	99.1	100.0	
Missing	System	3	.9			
Total			317	100.0		
Gas	Valid	Single persons	80	30.1	30.2	30.2
		Two persons	111	41.7	41.9	72.1
		Three persons	35	13.2	13.2	85.3
		Four persons	12	4.5	4.5	89.8
		Five or more p.	27	10.2	10.2	100.0
		Total	265	99.6	100.0	
Missing	System	1	.4			
Total			266	100.0		

Number of bathrooms

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Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	1.0	200	63.1	63.9	63.9
		2.0	107	33.8	34.2	98.1
		3.0	5	1.6	1.6	99.7
		4.0	1	.3	.3	100.0
		Total	313	98.7	100.0	
Missing	System	4	1.3			
Total			317	100.0		
Gas	Valid	1.0	160	60.2	60.8	60.8
		2.0	97	36.5	36.9	97.7
		3.0	5	1.9	1.9	99.6
		4.0	1	.4	.4	100.0
		Total	263	98.9	100.0	
Missing	System	3	1.1			
Total			266	100.0		

Existing household energy sources

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	electricity and natural gas only	289	91.2	94.4	94.4
		electricity only	16	5.0	5.2	99.7
		electricity natural gas and LPG	1	.3	.3	100.0
		Total	306	96.5	100.0	
		Missing	System	11	3.5	
Total			317	100.0		
Gas	Valid	electricity and natural gas only	256	96.2	99.2	99.2
		electricity only	1	.4	.4	99.6
		electricity natural gas and LPG	1	.4	.4	100.0
		Total	258	97.0	100.0	
		Missing	System	8	3.0	
Total			266	100.0		

Wood energy source

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	No	303	95.6	96.5	96.5
		Yes	11	3.5	3.5	100.0
		Total	314	99.1	100.0	
Missing	System	3	.9			
Total			317	100.0		
Gas	Valid	No	258	97.0	97.4	97.4
		Yes	7	2.6	2.6	100.0
		Total	265	99.6	100.0	
Missing	System	1	.4			
Total			266	100.0		

Dwelling has Controlled Load Electricity?

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	No	259	81.7	89.9	89.9
		Yes	29	9.1	10.1	100.0
		Total	288	90.9	100.0	
Missing	System	29	9.1			
Total			317	100.0		
Gas	Valid	No	224	84.2	92.6	92.6
		Yes	18	6.8	7.4	100.0
		Total	242	91.0	100.0	
Missing	System	24	9.0			
Total			266	100.0		

Existing HWS tank size

Energy source			Frequency	Percent	Valid Percent	Cumulative %
Electricity	Valid	small approx 160L	172	54.3	69.1	69.1
		medium appr. 250L	43	13.6	17.3	86.3
		Large approx 350L	34	10.7	13.7	100.0
		Total	249	78.5	100.0	
Missing	System	68	21.5			
Total			317	100.0		
Gas	Valid	small approx 160L	145	54.5	71.1	71.1
		medium appr. 250L	35	13.2	17.2	88.2
		Large approx 350L	24	9.0	11.8	100.0
		Total	204	76.7	100.0	
Missing	System	62	23.3			
Total			266	100.0		

Age of existing HWS

Energy source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	0-2 years	2	.6	.7	.7
		3-5 years	6	1.9	2.0	2.7
		6-8 years	16	5.0	5.5	8.2
		9-12 years	64	20.2	21.8	30.0
		13-16 years	79	24.9	27.0	57.0
		17-20 years	46	14.5	15.7	72.7
		21 and older	80	25.2	27.3	100.0
		Total	293	92.4	100.0	
Missing	System	24	7.6			
Total			317	100.0		
Gas	Valid	0-2 years	2	.8	.8	.8
		3-5 years	4	1.5	1.6	2.4
		6-8 years	16	6.0	6.5	8.9
		9-12 years	55	20.7	22.4	31.3
		13-16 years	69	25.9	28.0	59.3
		17-20 years	40	15.0	16.3	75.6
		21 and older	60	22.6	24.4	100.0
		Total	246	92.5	100.0	
Missing	System	20	7.5			
Total			266	100.0		

Washing machine size

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	very small < 5kg	5	1.6	2.5	2.5
		small 5-6.5kg	61	19.2	30.3	32.8
		medium 6.5-7.5kg	95	30.0	47.3	80.1
		large 7.5kg or larger	40	12.6	19.9	100.0
		Total	201	63.4	100.0	
Missing	System	116	36.6			
Total			317	100.0		
Gas	Valid	very small < 5kg	4	1.5	2.4	2.4
		small 5-6.5kg	52	19.5	30.6	32.9
		medium 6.5-7.5kg	79	29.7	46.5	79.4
		large 7.5kg or larger	35	13.2	20.6	100.0
		Total	170	63.9	100.0	
Missing	System	96	36.1			
Total			266	100.0		

Dwelling has Rooftop Photo-Voltaics?

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	No	228	71.9	72.8	72.8
		Yes	85	26.8	27.2	100.0
		Total	313	98.7	100.0	
Missing	System	4	1.3			
Total			317	100.0		
Gas	Valid	No	197	74.1	74.9	74.9
		Yes	66	24.8	25.1	100.0
		Total	263	98.9	100.0	
Missing	System	3	1.1			
Total			266	100.0		

Number of showers per week

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	0 to 7 showers	117	36.9	37.5	37.5
		8 to 14 showers	102	32.2	32.7	70.2
		15 to 21 showers	50	15.8	16.0	86.2
		22+ showers	43	13.6	13.8	100.0
		Total	312	98.4	100.0	
Missing	System	5	1.6			
Total			317	100.0		
Gas	Valid	0 to 7 showers	97	36.5	37.0	37.0
		8 to 14 showers	95	35.7	36.3	73.3
		15 to 21 showers	35	13.2	13.4	86.6
		22+ showers	35	13.2	13.4	100.0
		Total	262	98.5	100.0	
Missing	System	4	1.5			
Total			266	100.0		

Number of washes per week

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	1 to 4 washes	89	28.1	43.8	43.8
		5 to 9 washes	105	33.1	51.7	95.6
		10 or more washes	9	2.8	4.4	100.0
		Total	203	64.0	100.0	
Missing	System	114	36.0			
Total			317	100.0		
Gas	Valid	1 to 4 washes	74	27.8	43.5	43.5
		5 to 9 washes	90	33.8	52.9	96.5
		10 or more washes	6	2.3	3.5	100.0
		Total	170	63.9	100.0	
Missing	System	96	36.1			
Total			266	100.0		

Average shower time

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	Short 6 minutes or less	170	53.6	54.8	54.8
		Medium 7 to 12 minutes	116	36.6	37.4	92.3
		Long 13 or more minutes	24	7.6	7.7	100.0
		Total	310	97.8	100.0	
Missing	System	7	2.2			
Total			317	100.0		
Gas	Valid	Short 6 minutes or less	141	53.0	54.2	54.2
		Medium 7 to 12 minutes	98	36.8	37.7	91.9
		Long 13 or more minutes	21	7.9	8.1	100.0
		Total	260	97.7	100.0	
Missing	System	6	2.3			
Total			266	100.0		

Employment status of householder

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	Employed (pt or ft)	48	15.1	15.4	15.4
		Unemployed	20	6.3	6.4	21.8
		Retired	163	51.4	52.2	74.0
		Not in workforce	81	25.6	26.0	100.0
		Total	312	98.4	100.0	
Missing	System	5	1.6			
Total			317	100.0		
Gas	Valid	Employed (pt or ft)	43	16.2	16.3	16.3
		Unemployed	15	5.6	5.7	22.0
		Retired	141	53.0	53.4	75.4
		Not in workforce	65	24.4	24.6	100.0
		Total	264	99.2	100.0	
Missing	System	2	.8			
Total			266	100.0		

Weekly household income

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	Low income (< \$1000)	227	71.6	73.9	73.9
		Middle income (\$1000 - \$2000)	64	20.2	20.8	94.8
		High income (>\$2000)	16	5.0	5.2	100.0
		Total	307	96.8	100.0	
Missing	System	10	3.2			
Total			317	100.0		
Gas	Valid	Low income (< \$1000)	187	70.3	72.2	72.2
		Middle income (\$1000 - \$2000)	56	21.1	21.6	93.8
		High income (>\$2000)	16	6.0	6.2	100.0
		Total	259	97.4	100.0	
Missing	System	7	2.6			
Total			266	100.0		

Highest education level

Energy Source			Frequency	Percent	Valid Percent	Cumulative Percent
Electricity	Valid	Primary	17	5.4	5.5	5.5
		Secondary	123	38.8	40.1	45.6
		TAFE of Uni	167	52.7	54.4	100.0
		Total	307	96.8	100.0	
Missing	System	10	3.2			
Total			317	100.0		
Gas	Valid	Primary	15	5.6	5.8	5.8
		Secondary	100	37.6	38.8	44.6
		TAFE of Uni	143	53.8	55.4	100.0
		Total	258	97.0	100.0	
Missing	System	8	3.0			
Total			266	100.0		

Appendix F2

Fuel type = Electricity			Pre		Post			
Factor	Level	N	Obs	Mean	Obs	Mean	Post-Pre	p-value
Home Type	House	102	2558	9.287	622	7.982	-1.305	0.025
	Unit or Flat	35	869	7.947	112	7.434	-0.513	0.620
Home ownership status	Owned or mortgaged	253	6465	9.764	1931	9.497	-0.267	0.740
	Community Housing	12	277	9.396	39	10.200	0.804	0.479
Home Age	< 10 years	12	313	11.333	109	11.556	0.223	0.848
	10 to 20 years	33	794	11.276	305	10.218	-1.058	0.344
	> 20 years	238	6017	9.287	1503	8.626	-0.660	0.295
Number of household occupants	Single person household	101	2578	6.736	706	6.499	-0.237	0.659
	Two person household	121	3086	9.821	890	9.928	0.108	0.906
	Three person household	43	1053	10.939	250	9.913	-1.026	0.287
	Four person household	17	431	11.378	131	10.230	-1.148	0.423
	Five of more person household	31	770	15.938	218	15.902	-0.037	0.982
number of bathrooms	1	199	5003	9.011	1343	8.776	-0.235	0.768
	2	107	2726	10.577	809	10.080	-0.497	0.530
	3	5	135	10.788	30	9.093	-1.695	0.270
	4	1	26	31.752	7	28.095	-3.657	0.021
existing household energy sources	electricity and LPG only	0						
	electricity and natural gas only	288	7259	9.569	2031	9.482	-0.088	0.908
	electricity only	16	412	11.589	112	8.398	-3.192	0.046
	electricity natural gas and LPG	1	26	8.540	10	9.562	1.022	0.067
wood energy source	No	302	7644	9.602	2152	9.445	-0.158	0.831
	Yes	11	274	10.893	43	6.822	-4.071	0.015
Dwelling has Controlled Load Electricity?	No	258	6581	9.487	1746	9.536	0.050	0.953
	Yes	29	708	9.611	263	7.557	-2.055	0.029
existing HWS tank size	small approx 160L	171	4326	8.915	1209	8.946	0.031	0.972
	medium approx 250L	43	1123	10.432	340	9.848	-0.584	0.564
	Large approx 350L	34	865	10.788	204	10.072	-0.716	0.602
existing age of HWS	0-2 years	2	43	18.510	11	14.466	-4.044	0.000
	3-5 years	6	160	10.502	45	9.419	-1.082	0.493
	6-8 years	16	407	9.859	117	10.195	0.336	0.728
	9-12 years	64	1621	11.010	497	11.405	0.395	0.749
	13-16 years	78	1953	9.589	528	9.734	0.145	0.860
	17-20 years	46	1199	8.797	335	8.028	-0.769	0.358
washing machine size	21 and older	80	2025	8.884	562	8.510	-0.374	0.699
	very small < 5kg	5	131	6.953	39	5.611	-1.342	0.029
	small 5-6.5kg	61	1542	8.732	360	7.882	-0.850	0.306
	medium 6.5-7.5kg	94	2351	8.845	551	7.311	-1.534	0.005
Dwelling has Rooftop Photo-Voltaics?	large 7.5kg or larger	40	998	12.921	256	12.539	-0.382	0.795
	No	227	5703	10.241	1562	10.149	-0.092	0.901
Number of showers per week	Yes	85	2188	8.134	610	7.687	-0.448	0.607
	0 to 7 showers	116	2897	7.279	730	6.627	-0.651	0.210
No washes per week	8 to 14 showers	102	2649	9.306	780	9.104	-0.203	0.803
	15 to 21 showers	50	1242	11.960	336	11.657	-0.303	0.804
	22+ showers	43	1074	14.489	340	12.587	-1.902	0.141
Average shower time	1 to 4 washes	89	2249	8.296	531	7.325	-0.971	0.088
	5 to 9 washes	104	2599	10.002	657	9.259	-0.743	0.399
	10 or more washes	9	210	17.641	42	14.235	-3.406	0.141
Employment status of householder	Short 6 minutes or less	170	4358	9.081	1315	8.758	-0.323	0.645
	Medium 7 to 12 minutes	116	2897	10.418	714	10.605	0.187	0.876
	Long 13 or more minutes	24	584	9.479	149	11.148	1.669	0.303
Weekly household income	Unemployed (pt or ft)	47	1157	11.595	322	9.787	-1.809	0.050
	Unemployed	20	475	10.282	150	10.539	0.257	0.829
	Retired	163	4149	8.484	852	7.065	-1.419	0.001
	Not in workforce	81	2087	11.257	843	10.523	-0.734	0.362
Highest education level	Low income (< \$1000)	226	5676	8.532	1625	8.469	-0.063	0.926
	Middle income (\$1000 - \$2000)	64	1658	12.203	421	12.798	0.595	0.709
	High income (>\$2000)	16	423	12.901	97	13.703	0.802	0.748
Highest education level	Primary	17	423	6.543	116	4.917	-1.626	0.087
	Secondary	123	3100	9.622	832	9.858	0.236	0.817
	TAFE of Uni	166	4205	10.010	1207	9.577	-0.433	0.557

Table 8: The impact of Demographic Factors on Intervention effect for Energy Source = Electricity

Home Energy Efficiency Upgrade Program FINAL REPORT

Fuel type = Gas			Pre		Post		Post-Pre	p-value
Factor	Level	N	Obs	Marginal Mean	Obs	Marginal Mean		
Home Type	House	90	2200	136.902	412	122.919	-13.982	0.192
	Unit or Flat	24	577	72.123	50	73.141	1.018	0.941
Home ownership status	Owned or mortgaged	218	5397	132.583	1288	111.190	-21.393	0.003
	Community Housing	8	152	127.653	15	110.191	-17.462	0.426
Home Age	< 10 years	13	308	129.068	88	108.392	-20.676	0.291
	10 to 20 years	32	774	132.901	235	102.072	-30.829	0.000
	> 20 years	188	4635	130.552	879	111.735	-18.817	0.015
Number of household occupants	Single person household	80	2009	96.339	422	90.214	-6.125	0.460
	Two person household	110	2723	135.395	609	115.455	-19.940	0.006
	Three person household	35	785	151.925	165	113.855	-38.071	0.009
	Four person household	12	280	128.701	83	121.111	-7.590	0.675
	Five of more person household	27	705	178.021	149	158.592	-19.429	0.225
number of bathrooms	1	160	3929	117.055	787	100.090	-16.965	0.021
	2	96	2370	151.080	592	125.369	-25.711	0.003
	3	5	130	164.097	22	122.042	-42.056	0.000
	4	1	26	139.808	11	118.201	-21.606	0.000
existing household energy sources	electricity and LPG only	0						
	electricity and natural gas only	255	6270	129.204	1378	110.839	-18.364	0.008
	electricity only	1	26	78.973	7	78.522	-0.451	0.884
wood energy source	electricity natural gas and LPG	1	26	246.923	8	266.460	19.536	0.051
	No	257	6321	129.975	1403	112.603	-17.372	0.011
Dwelling has Controlled Load Electricity?	Yes	7	181	119.066	25	79.811	-39.256	0.170
	No	223	5457	131.385	1154	113.213	-18.172	0.014
existing HWS tank size	Yes	18	459	101.985	135	95.306	-6.679	0.591
	small approx 160L	144	3461		803		0.000	
	medium approx 250L	35	853		190		0.000	
existing age of HWS	Large approx 350L	24	645		109		0.000	
	0-2 years	2	51	129.346	6	137.694	8.349	0.051
	3-5 years	4	110	212.925	33	189.445	-23.480	0.021
	6-8 years	16	392	114.505	89	80.615	-33.890	0.012
	9-12 years	55	1302	155.793	357	127.155	-28.638	0.026
	13-16 years	68	1652	131.116	336	119.545	-11.571	0.251
	17-20 years	40	1007	134.469	240	88.810	-45.660	0.000
21 and older	60	1510	107.757	290	96.675	-11.082	0.170	
washing machine size	very small < 5kg	4	105		16		0.000	
	small 5-6.5kg	52	1196		208		0.000	
	medium 6.5-7.5kg	78	1967		360		0.000	
	large 7.5kg or larger	35	861		167		0.000	
Dwelling has Rooftop Photo-Voltaics?	No	197	4908	132.275	1029	118.046	-14.230	0.065
	Yes	65	1557	123.937	378	95.397	-28.541	0.001
Number of showers per week	0 to 7 showers	97	2382	114.072	459	104.291	-9.781	0.292
	8 to 14 showers	94	2332	131.411	514	105.035	-26.376	0.001
	15 to 21 showers	35	840	147.567	198	120.225	-27.342	0.014
	22+ showers	35	873	157.380	239	133.813	-23.568	0.052
No washes per week	1 to 4 washes	74	1827	128.100	330	122.238	-5.862	0.605
	5 to 9 washes	89	2133	138.992	416	128.998	-9.994	0.303
	10 or more washes	6	168	172.633	18	223.580	50.947	0.096
Average shower time	Short 6 minutes or less	140	3402	124.436	865	109.878	-14.558	0.037
	Medium 7 to 12 minutes	98	2434	139.763	440	111.674	-28.089	0.004
	Long 13 or more minutes	21	537	124.315	97	137.819	13.505	0.401
Employment status of householder	Employed (pt or ft)	43	1002	153.810	211	134.583	-19.227	0.112
	Unemployed	15	338	111.767	75	107.415	-4.352	0.735
	Retired	141	3518	123.126	530	107.436	-15.690	0.035
	Not in workforce	64	1617	134.693	597	107.203	-27.490	0.000
Weekly household income	Low income (< \$1000)	186	4586	121.798	1016	107.327	-14.471	0.045
	Middle income (\$1000 - \$2000)	56	1362	152.295	302	123.923	-28.372	0.008
	High income (>\$2000)	16	417	142.195	73	129.871	-12.324	0.357
Highest education level	Primary	15	356	79.100	77	97.847	18.747	0.123
	Secondary	99	2424	126.922	542	96.602	-30.320	0.001
	TAFE of Uni	143	3535	137.857	783	125.568	-12.290	0.109

Table 9: The impact of Demographic Factors on Intervention effect for Energy Source = Gas