

APPENDIX C: ENERGY USAGE AND EMISSIONS BY SECTOR AND YEAR

Appendix C presents the entirety of this inventory's outputs by both energy type and GHG emissions by sector and year. Tables C-1 and C-2 provide energy consumption data on a total basis and a per-capita basis. Note regarding energy use follow Table C-2. Tables C-3 and C-4 provide emissions data on a total basis and a per-capita basis. Notes regarding emissions follow Table C-4.

Table C-1: Total energy use by sector and year

Sector	Note	Unit	2006	2007	2008	2009	2010
Residential Electricity	1	kWh	4,957,128,372	5,234,984,703	4,985,215,444	4,985,809,019	5,366,142,672
Residential Natural Gas	2	therms	163,279,747	177,504,347	178,656,732	181,608,585	185,393,179
Commercial Electricity	1	kWh	5,925,905,138	6,153,587,240	6,096,775,760	5,919,452,368	5,976,199,142
Commercial Natural Gas	2	therms	60,529,169	63,702,168	64,315,722	63,957,425	64,167,070
Industrial Electricity	1	kWh	155,796,127	146,256,367	120,591,922	120,874,291	117,295,218
Industrial Natural Gas	2	therms	28,496,373	26,588,025	24,024,929	26,225,554	25,749,351
Passenger Vehicle		gal	305,376,116	307,799,734	311,644,222	316,256,977	317,692,893
Light Duty Vehicle		gal	52,618,830	54,337,129	54,845,426	53,782,240	54,617,933
Heavy Duty Vehicle		gal	57,839,827	55,006,601	56,077,960	52,826,451	57,008,544
County-based Passenger Vehicle		gal	147,794,030	148,366,225	148,557,799	150,499,497	150,490,148
County-based Light Duty Vehicle		gal	25,466,134	26,191,689	26,144,286	25,593,744	25,872,347
County-based Heavy Duty Vehicle		gal	27,992,959	26,514,389	26,731,823	25,138,906	27,004,772
External Passenger Vehicle		gal	157,582,086	159,433,509	163,086,423	165,757,480	167,202,745
External Light Duty Vehicle		gal	27,152,696	28,145,441	28,701,140	28,188,496	28,745,586
External Heavy Duty Vehicle		gal	29,846,868	28,492,213	29,346,137	27,687,545	30,003,772
Off-Road Vehicle	7	gal	n.a.	n.a.	n.a.	n.a.	n.a.

Sector	Note	Unit	2006	2007	2008	2009	2010
Metrorail		kWh	100,620,946	100,174,219	94,978,664	93,209,842	106,120,192
Commuter Rail		gal	174,100	352,765	463,823	367,575	375,165
Sector	Note	Unit	2006	2007	2008	2009	2010
County Operations-Electricity	3,4	kWh	557,301,768	565,734,851	568,933,533	559,968,145	580,165,555
County Operations-Direct Combustion ... Natural Gas	3,4	therms	8,712,694	10,150,528	10,796,115	11,665,677	11,242,539
County Operations-Direct Combustion ... #2 Fuel Oil	3,4,6	gal	68,006	95,288	116,039	219,094	66,013
County Operations-Direct Combustion ... Propane	3,4	gal	31,224	38,585	34,390	40,406	30,270
County Operations-Mobile	3,5	gal	87,110	87,116	94,348	100,499	102,754

Table C-2: Per capita energy use by sector and year

Sector energy, per capita	Note	2006	2007	2008	2009	2010
Residential Electricity	7	4,778.83	5,026.36	4,767.38	4,739.41	4,964.04
Residential Natural Gas	7	157.41	170.43	170.85	172.63	171.50
Commercial Electricity	7	5,712.76	5,908.35	5,830.36	5,626.91	5,528.38
Commercial Natural Gas	7	58.35	61.16	61.51	60.80	59.36
Industrial Electricity	7	150.19	140.43	115.32	114.90	108.51
Industrial Natural Gas	7	27.47	25.53	22.98	24.93	23.82
Passenger	7	294.39	295.53	298.03	300.63	293.89
Light Duty	7	50.73	52.17	52.45	51.12	50.53
Heavy Duty	7	55.76	52.81	53.63	50.22	52.74
County-based Passenger	7	142.48	142.45	142.07	143.06	139.21
County-based Light Duty	7	24.55	25.15	25.00	24.33	23.93
County-based Heavy Duty	7	26.99	25.46	25.56	23.90	24.98
External Passenger	7	151.91	153.08	155.96	157.57	154.67
External Light Duty	7	26.18	27.02	27.45	26.80	26.59
External Heavy Duty	7	28.77	27.36	28.06	26.32	27.76
Off-Road	8	n.a.	n.a.	n.a.	n.a.	n.a.
Commuter Rail	7	0.17	0.34	0.44	0.35	0.35
Metrorail	7	97.00	96.18	90.83	88.60	98.17
County Operations-Electricity	7	537.26	543.19	544.07	532.29	536.69

Sector energy, per capita	Note	2006	2007	2008	2009	2010
County Operations-Direct Combustion Wash. Gas	7	8.40	9.75	10.32	11.09	10.40
County Operations-Direct Combustion #2 Fuel Oil	7	0.07	0.09	0.11	0.21	0.06
County Operations-Direct Combustion Propane	7	0.03	0.04	0.03	0.04	0.03
County Operations-Mobile	7	0.08	0.08	0.09	0.10	0.10

NOTES REGARDING ENERGY USE:

1. Electricity is gross in-county usage provided by DVP and NOVEC at the meter and does not account for transmission loss or any Renewable Energy Credits (RECs, started by DVP in 2009).
2. Natural gas includes net in-county usage provided by Washington Gas and Columbia Gas (2006 only) at the meter and does not account for transmission loss or any carbon offsets (started by Washington Gas in 2011).
3. County operations include county schools' operations and county-operated bus transit. Each also includes both stationary and mobile emissions.
4. Stationary component of county operations is not included in other sectors' stationary usage.
5. Mobile component of county operations is included in communitywide mobile inventory, thus is not double counted here.
6. A factor of three variations in #2 fuel oil usage across years can be explained by intentional decision to use up existing supplies,
7. Per capita data calculated by dividing total emissions by the county's population estimates, with energy units per Annex C.1:

2006	2007	2008	2009	2010
1,037,311	1,041,507	1,045,694	1,051,990	1,081,004

8. Off-road vehicular emissions were calculated without direct access to underlying energy usage, also without any specific inputs from our research team, per EPA's NONROAD2008a model (9).

Table C-3: Total GHG emissions by sector and year in MTCO₂e

Sector	Note	2006	2007	2008	2009	2010
Total Emissions (in MTCO₂e)	1	11,838,076	12,210,986	12,097,494	11,978,115	12,217,349
Residential Electricity	2	2,592,289	2,737,592	2,606,977	2,581,563	2,737,791
Residential Natural Gas	3	866,365	941,840	947,955	963,618	983,699
Commercial Electricity	2	3,098,903	3,217,967	3,188,258	3,064,986	3,049,040
Commercial Natural Gas	3	321,169	338,005	341,260	339,359	340,471
Industrial Electricity	2	81,472	76,484	63,063	62,587	59,844
Industrial Natural Gas	3	151,202	141,076	127,477	139,153	136,626
Passenger		2,822,318	2,844,718	2,880,249	2,922,880	2,936,151
Light Duty		486,309	502,189	506,887	497,061	504,785
Heavy Duty		595,911	566,721	577,759	544,259	587,346
County-based Passenger		1,365,928	1,371,216	1,372,987	1,390,932	1,390,846
County-based Light Duty		235,361	242,066	241,628	236,540	239,115
County-based Heavy Duty		288,405	273,172	275,412	259,001	278,224
External Passenger		1,456,390	1,473,501	1,507,262	1,531,948	1,545,305
External Light Duty		250,948	260,123	265,259	260,521	265,670
External Heavy Duty		307,506	293,549	302,347	285,259	309,122
Off-Road		429,187	438,185	447,775	457,665	467,600
Metrorail		52,619	52,385	49,668	48,262	54,142
Commuter Rail		1,794	3,634	4,779	3,787	3,865
County Operations	4	425,649	437,306	449,736	453,434	458,743
County Operations-Stationary	5	338,540	350,190	355,388	352,934	355,989
County Operations-Electricity	5	291,436	295,846	297,519	289,941	295,999
County Operations-Direct Combustion	5	47,103	54,343	57,869	62,993	59,990
County Operations-Mobile	6	87,110	87,116	94,348	100,499	102,754

Table C-4: Per capita GHG emissions by sector and year

Sector	Note	2006	2007	2008	2009	2010
Total Emissions (in MTCO₂e per capita)		11.41	11.72	11.57	11.39	11.30
Residential Electricity per capita	7	2.50	2.63	2.49	2.45	2.53
Residential Natural Gas per capita	7	0.84	0.90	0.91	0.92	0.91
Commercial Electricity per capita	7	2.99	3.09	3.05	2.91	2.82
Commercial Natural Gas per capita	7	0.31	0.32	0.33	0.32	0.31
Industrial Electricity per capita	7	0.08	0.07	0.06	0.06	0.06
Industrial Natural Gas per capita	7	0.15	0.14	0.12	0.13	0.13
Passenger per capita	7	2.72	2.73	2.75	2.78	2.72
Light Duty per capita	7	0.47	0.48	0.48	0.47	0.47
Heavy Duty per capita	7	0.57	0.54	0.55	0.52	0.54
County-based Passenger per capita	7	1.32	1.32	1.31	1.32	1.29
County-based Light Duty per capita	7	0.23	0.23	0.23	0.22	0.22

Sector	Note	2006	2007	2008	2009	2010
County-based Heavy Duty per capita	7	0.28	0.26	0.26	0.25	0.26
External Passenger per capita	7	1.40	1.41	1.44	1.46	1.43
External Light Duty per capita	7	0.24	0.25	0.25	0.25	0.25
External Heavy Duty per capita	7	0.30	0.28	0.29	0.27	0.29
Off-Road per capita	7	0.41	0.42	0.43	0.44	0.43
Metrorail per capita	7	0.05	0.05	0.05	0.05	0.05
Commuter Rail per capita	7	0.00	0.00	0.00	0.00	0.00
County Operations per capita	7	0.41	0.42	0.43	0.43	0.42
County Operations-Stationary per capita	7	0.33	0.34	0.34	0.34	0.33
County Operations-Electricity per capita	7	0.28	0.28	0.28	0.28	0.27
County Operations-Direct Combustion per capita	7,8	0.05	0.05	0.06	0.06	0.06
County Operations-Mobile per capita	9	0.08	0.08	0.09	0.10	0.10

NOTES REGARDING EMISSIONS:

1. County mobile operations are omitted from total GHG emissions to prevent double counting as part of total mobile units' emissions.
2. Electricity is gross in-county usage provided by DVP and NOVEC at the meter, and does not account for transmission loss or any Renewable Energy Credits (RECs, started by DVP in 2009).
3. Natural gas includes net in-county usage provided by Washington Gas and Columbia Gas (2006 only) at the meter, and does not account for transmission loss or any Carbon offsets (started by Washington Gas in 2011).
4. County operations include county schools' operations and county-operated bus transit. Each also includes both stationary and mobile emissions.
5. Stationary component of county operations is not included in other sectors' stationary usage.
6. Mobile component of county operations is included in community-wide mobile portion of inventory, thus is not double counted here.
7. Per capita data calculated by dividing total emissions by the county's population estimates:

2006	2007	2008	2009	2010
1,037,311	1,041,507	1,045,694	1,051,990	1,081,004

8. While county operations include stationary fuel oil and propane emissions, the broader community's stationary fuel oil and propane emissions were not calculated due to expected minor (<2% of total) contribution and difficulty in obtaining accurate data.
9. Mobile component of county operations is included in community-wide mobile portion of the inventory, thus is not double counted here.