Institute of Social and Economic Research
University of Alaska Anchorage
Web Notes

Estimated Household Costs for Home Energy Use, May 2008

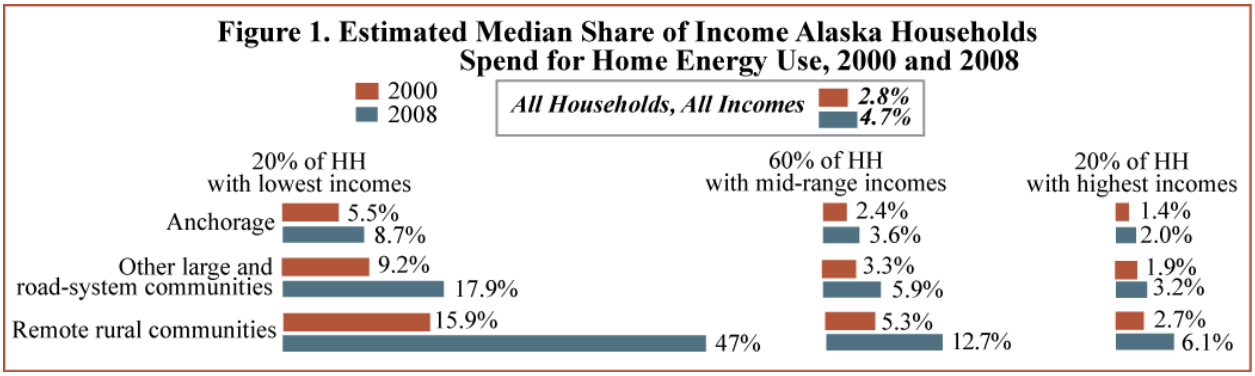
Ben Saylor, Sharman Haley, and Nick Szymoniak Note No. 1 Revised June 24, 2008

This memo estimates how much of their income Alaska households spend for home energy uses, after years of rising energy prices.[1] We made the estimates at the request of State Senator Lyman Hoffman. We include costs for electricity, heat, and other home energy uses—but do not include costs for transportation fuel. Keep in mind that these are truly estimates. Because of time lags in data collection and reporting, actual consumer price data for 2008 are not available. To estimate consumer energy prices as of May 2008, we used statistical models of the relationship between oil prices and consumer prices. We also used the most recent data on per capita personal income from the Bureau of Economic Analysis to estimate 2007 annual household income.

These estimates are likely to overstate actual household expenditures. As energy costs rise, households find ways to consume less. How much less, we don't know. For these estimates, we used consumption households reported at the time of the 2000 U.S. Census. Also, the estimates in this memo reflect what energy would cost households for a year, at May 2008 prices. Consumers of course haven't yet seen a full year at these prices, and we don't know where prices will go from here.[2] Therefore, these estimates are really like a cost index—that is, they estimate what it would cost to buy a specific amount of energy, at specific prices. That's not the same as actual annual household expenditures.

Still, these estimates give a good picture of what households in different areas of the state and at different income levels currently must spend for home energy use. The appendix explains our methods in detail. Figure 1 summarizes our estimates of the shares of household income spent for home energy use in 2008 and compares them with 2000 shares. Later tables provide more geographic and income-level detail for 2008. Remember that energy sources differ around that state, as Figure 2 will show. Figure 1 breaks Alaska into three regions: (1) Anchorage; (2) other large or road-system communities; and (3) remote rural communities. It also estimates the share of household income Alaskans with different incomes pay: (1) the 20% of households with the lowest incomes; (2) the 60% with mid-range incomes; and (3) the 20% with the highest incomes.

Figure 1. Estimated Median Share of Income Alaska Households Spend for Home Energy Use, 2000 and 2008



[1] This analysis builds on an earlier study, by Ben Saylor and Sharman Haley, *Effects of Rising Utility Costs on Household Budgets*, 2000-2006, March 2007. See www.iser.uaa.alaska.edu/Publications/risingutilitycosts_final.pdf

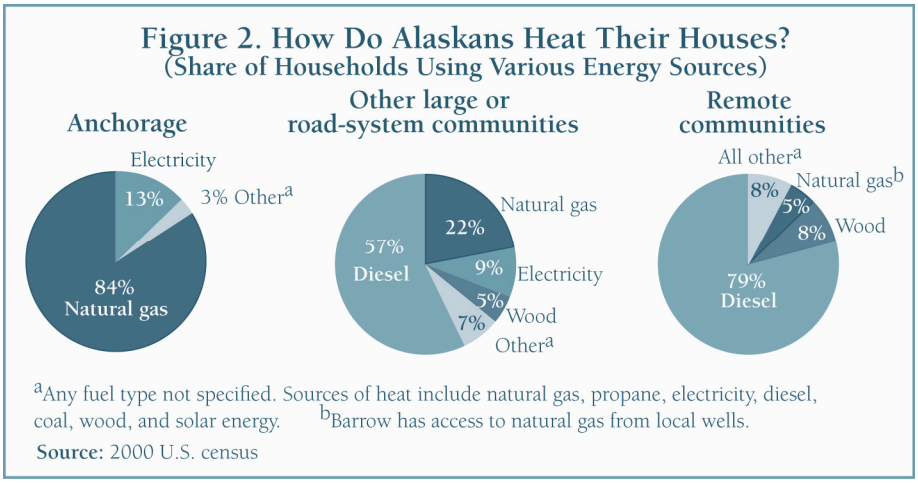
[2] World crude oil prices were hovering around $130 per barrel at the end of May, 2008. Source: U.S. Energy Information Administration. World Crude Oil Prices. http://tonto.eia.doe.gov/dnav/pet/pet_pri_wco_k_w.htm .

Summary of Estimates

Taken together, all Alaska households, at all incomes levels, typically spend an estimated 4.7% of their income for home energy, compared with 2.8% in 2000. But the variation across regions and income levels is big. Anchorage households in general spend the lowest percentage of income for energy—but the share among the poorest households was up from 5.5% in 2000 to 8.7% in 2008. Among the wealthiest Anchorage households, the share rose from 1.4% to 2%. Natural gas generates electricity and provides home-heating fuel for most Anchorage households (as Figure 2 shows). Prices of natural gas have risen sharply in recent years, but on an energy-equivalent basis, natural gas is still much less expensive than diesel (also called fuel oil). Also, incomes in Anchorage tend to be higher than in most rural places, especially in the most remote areas.

Households in other large and road-system communities typically spend—depending on their income level—anywhere from about 3% to 18% of income for home energy. That compares with about 2% to 9% in 2000. Households in some of these places have access to natural gas, but more than half rely on diesel. Many of those communities can get fuel delivered by road, which is generally less expensive than delivery by air or water.

Remote rural households, which rely mainly on diesel and can get fuel only by water or air, spend by far the biggest share of income for home energy. A recent ISER study found that prices for diesel in rural areas vary by as much as 100%, depending on how far the fuel has to travel, how difficult it is to reach specific communities, the amount of local storage capacity, the condition of local moorage and unloading equipment, and other factors.[3] Remote households with the lowest incomes face the highest costs for home energy—an estimated 47% of their income, compared with about 16% in 2000. Remote households with higher incomes must spend an estimated 6% to 13% of their incomes for home energy. Keep in mind that incomes in some remote areas—especially southwestern Alaska—are much lower than the state average. In 2005, for example, per capita incomes in southwest Alaska were roughly one third to one half below the state average.



[3] Meghan Wilson, Ben Saylor, Nick Szymoniak, Steve Colt, and Ginny Fay, *Dollars of Difference: What Affects Fuel Prices Around Alaska?* ISER Research Summary No. 68, May 2008. Online at: www.iser.uaa.alaska.edu/Publications/researchsumm/RS_68.pdf

Energy Costs in Household Budgets

Tables 1, 2 and 3 show the costs of heating fuel, electricity and gas for Alaska households by region and income quintile. These tables are calculated from household-level data provided in the Public Use Micro-Sample (PUMS) of the 2000 Census for Alaska. Because we are using data for individual households, we calculate costs only for the households that use each energy source, and when we report median cost, it is the median among those households that use that energy source. As Figure 2 shows, 84 percent of Anchorage homes are heated with natural gas and 13 percent use electric heat. In remote rural communities 79 percent of homes use diesel fuel for heat, less than 4 percent use electricity, and the only remote community that has access to utility natural gas is Barrow. Because different households and regions use different fuel sources for heat, the most meaningful comparison across regions appears in Table 4, which aggregates all three energy sources in one table representing all Alaska households.

Our calculations of costs as a percentage of income also use household-level data on income. When we report median, it is the median of the percentages calculated for individual households; it is NOT the median cost as a percentage of median household income. This is an important distinction because energy sources and consumption vary by income, and the distribution of costs is different than the distribution of income. For example, Anchorage households that use electricity as a heat source are more likely to be renters and poor. Similarly, rural households that heat with wood are more likely to be poor.

The income quintiles are based on state-wide data: the lowest quintile is the one-fifth of households statewide with the lowest incomes. These households are disproportionately located in rural Alaska. In our tables, the lowest quintile in rural Alaska will have the same range of incomes as the lowest quintile in Anchorage, yet will represent a much larger share of households.

We note that these estimates of median energy costs as a percentage of income by region mask a great deal of variation between communities within each region, especially in rural Alaska which is geographically and economically very diverse.

Table 1 shows the 2008 projected cost of heating fuel, for those households who reported using a liquid fuel (primarily diesel) for heat , as a percentage of 2007 household income, broken out by income quintile and region.[4] You can see that at current prices, the median household in remote rural Alaska faces about $4,900 in heating bills, 9.4 percent of their household income. Very few Anchorage households use these heat sources, but for those who do the cost is smaller. (Because this table includes a very small sample for Anchorage, the individual quintile figures are not very meaningful and are omitted from the table.) In Kenai and Mat-Su the typical costs are somewhat higher than in Anchorage, but still much lower than in rural Alaska. For Fairbanks, Juneau and road accessible communities the costs are projected to be between the costs in the Kenai/Mat-Su region and remote rural Alaska, although as a percentage of income, they are somewhat lower than Kenai/Mat-Su, because proportionally more households fall into the upper income quintiles. Heating costs represent a much larger share of the budget for poor households: a median of 20

[4] The households included in Table 1 differ from those included in the corresponding table in the original report. In this update, only households who reported primarily using a liquid fuel for heating are included, whereas in the original report, all households paying anything for liquid or solid heating fuel were included.

percent of the budget for the lowest quintile of households on the road system, and a whopping 32 percent for the lowest income quintile households in remote rural Alaska.

Table 1. Annual cost of liquid heating fuel, for those who pay, at May 2008 prices

Quintile	Household Income		Anchorage	Kenai & Mat-Su	Mid-Size & Roaded	Remote Rural	Total
			Cost in Dollars				
1	$28,715 and below	average	--	$3,539	$3,975	$5,236	$4,442
		median	--	$2,989	$3,520	$4,172	$3,985
2	$28,716 to $52,021	average	--	$3,604	$4,381	$5,263	$4,589
		median	--	$2,657	$3,520	$4,519	$3,985
3	$52,022 to $78,601	average	--	$3,540	$4,485	$6,002	$4,724
		median	--	$3,155	$4,225	$5,215	$4,172
4	$78,602 to $119,777	average	--	$3,810	$4,826	$5,897	$4,912
		median	--	$3,321	$4,225	$5,215	$4,225
5	over $119,777	average	--	$4,124	$4,979	$7,022	$5,306
		median	--	$3,653	$4,225	$6,258	$4,225
	Total	average	$5,263	$3,695	$4,634	$5,766	$4,822
		median	$2,633	$3,321	$4,225	$4,867	$4,225
			Cost as a Percentage of 2007 Household Income				
1	$28,715 and below	average	--	61.0%	38.0%	62.4%	52.9%
		median	--	20.1%	20.1%	32.4%	24.2%
2	$28,716 to $52,021	average	--	9.1%	10.7%	13.3%	11.4%
		median	--	6.9%	8.7%	11.4%	9.4%
3	$52,022 to $78,601	average	--	5.6%	6.9%	9.4%	7.4%
		median	--	4.8%	6.0%	7.7%	6.2%
4	$78,602 to $119,777	average	--	4.0%	4.9%	6.2%	5.1%
		median	--	3.5%	4.3%	5.3%	4.3%
5	over $119,777	average	--	2.5%	2.9%	4.4%	3.2%
		median	--	2.1%	2.5%	4.0%	2.7%
	Total	average	8.4%	17.5%	10.0%	24.0%	15.4%
		median	4.6%	5.0%	4.9%	9.4%	5.9%

Sources: U.S. Census Bureau (IPUMS)[5], Alaska Permanent Fund Division, Alaska Housing Finance Corporation, IRS Statistics of Income Division, U.S. Bureau of Economic Analysis, and ISER calculations

Table 2 shows the 2008 projected cost of electricity as a percentage of 2007 household income. At current prices, the median household in remote rural Alaska faces about $3,000 in electric bills, which is three times higher cost than for the median Anchorage household. This represents 6 percent of their household income, and is more than four times the budget share in Anchorage. Once again the poorest households face the largest burdens on their budgets: more than 4.5 percent of the budget for the lowest quintile of Anchorage households, and over 18 percent for low income households in rural Alaska.

[5] Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander. Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. http://usa.ipums.org/usa/

Table 2. Cost of electricity, for those who pay, at May 2008 prices

Quintile	Household Income		Anchorage	Kenai & Mat-Su	Mid-Size & Roaded	Remote Rural	Total
			Cost in Dollars				
1	$28,715 and below	average	$1,012	$1,392	$1,744	$3,138	$1,744
		median	$803	$1,145	$1,270	$2,585	$1,205
2	$28,716 to $52,021	average	$988	$1,577	$1,806	$3,441	$1,680
		median	$803	$1,363	$1,588	$3,102	$1,235
3	$52,022 to $78,601	average	$1,162	$1,577	$2,028	$3,940	$1,791
		median	$964	$1,363	$1,764	$3,102	$1,339
4	$78,602 to $119,777	average	$1,273	$1,571	$2,199	$4,234	$1,873
		median	$1,125	$1,363	$1,941	$3,619	$1,473
5	over $119,777	average	$1,501	$1,765	$2,432	$4,531	$2,067
		median	$1,339	$1,636	$2,117	$3,877	$1,636
	Total	average	$1,222	$1,568	$2,080	$3,726	$1,841
		median	$1,071	$1,363	$1,764	$3,102	$1,376
			Cost as a Percentage of 2007 Household Income				
1	$28,715 and below	average	11.4%	17.7%	16.6%	36.9%	19.7%
		median	4.6%	7.4%	8.0%	18.4%	7.7%
2	$28,716 to $52,021	average	2.5%	4.0%	4.6%	8.8%	4.2%
		median	2.0%	3.3%	3.8%	7.2%	3.1%
3	$52,022 to $78,601	average	1.8%	2.4%	3.2%	6.1%	2.8%
		median	1.5%	2.1%	2.8%	5.2%	2.1%
4	$78,602 to $119,777	average	1.3%	1.6%	2.2%	4.5%	1.9%
		median	1.2%	1.5%	2.0%	3.7%	1.5%
5	over $119,777	average	0.9%	1.1%	1.4%	2.8%	1.2%
		median	0.8%	1.0%	1.3%	2.5%	1.0%
	Total	average	2.9%	5.5%	5.1%	15.0%	5.5%
		median	1.3%	2.1%	2.4%	6.2%	2.0%

Sources: U.S. Census Bureau (IPUMS), Alaska Permanent Fund Division, UA Cooperative Extension Service (with ISER updates), Chugach Electric Association, Municipal Light and Power, Alaska Energy Authority, IRS Statistics of Income Division, U.S. Bureau of Economic Analysis, and ISER calculations

Table 3 shows the 2008 projected cost of gas, both natural gas and propane (the 2000 Census had one question asking for the total cost of both types of fuel), as a percentage of 2007 household income. The only remote rural community with access to access to natural gas is Barrow, but households using propane are also included in this table. Although remote rural households pay less for gas than households in Anchorage, their incomes tend to be lower, so as a percentage of income the median cost share is greater. In Anchorage, the poorest households pay around nine percent of their income for gas heat, while the richest pay about 1.3 percent of their income. In the Mid-Size & Roaded region, gas costs are lower, which is not because gas and propane are cheaper, but because a large number of households use another fuel type for heating but use a small amount gas for other purposes.

Table 3. Cost of gas, for those who pay, at May 2008 prices

Quintile	Household Income		Anchorage	Kenai & Mat-Su	Mid-Size & Roaded	Remote Rural	Total
			Cost in Dollars				
1	$28,715 and below	average	$1,870	$2,227	$915	$1,965	$1,847
		median	$1,695	$1,607	$527	$1,072	$1,449
2	$28,716 to $52,021	average	$1,762	$2,372	$1,186	$2,122	$1,916
		median	$1,671	$1,744	$791	$1,340	$1,572
3	$52,022 to $78,601	average	$1,879	$2,117	$1,549	$1,754	$1,894
		median	$1,695	$1,818	$1,054	$1,139	$1,646
4	$78,602 to $119,777	average	$1,998	$1,913	$1,696	$2,058	$1,957
		median	$1,941	$1,695	$1,212	$1,286	$1,794
5	over $119,777	average	$2,309	$2,239	$1,612	$1,754	$2,202
		median	$2,187	$2,039	$791	$1,243	$2,039
	Total	average	$2,019	$2,156	$1,412	$1,950	$1,984
		median	$1,892	$1,759	$791	$1,206	$1,744
			Cost as a Percentage of 2007 Household Income				
1	$28,715 and below	average	21.7%	25.5%	10.9%	28.7%	22.6%
		median	9.1%	9.8%	3.7%	8.4%	8.8%
2	$28,716 to $52,021	average	4.4%	5.9%	3.0%	5.6%	4.8%
		median	3.8%	4.3%	1.8%	3.3%	3.8%
3	$52,022 to $78,601	average	3.0%	3.2%	2.4%	2.7%	2.9%
		median	2.6%	2.8%	1.4%	1.8%	2.5%
4	$78,602 to $119,777	average	2.1%	2.0%	1.7%	2.2%	2.0%
		median	2.0%	1.7%	1.3%	1.3%	1.9%
5	over $119,777	average	1.3%	1.4%	1.0%	1.1%	1.3%
		median	1.3%	1.2%	0.4%	0.7%	1.2%
	Total	average	4.1%	7.0%	3.8%	10.5%	5.4%
		median	2.1%	2.5%	1.4%	2.7%	2.1%

Sources: U.S. Census Bureau (IPUMS), Alaska Permanent Fund Division, Alaska Housing Finance Corporation, Regulatory Commission of Alaska, Enstar Natural Gas, Fairbanks Natural Gas, Barrow Utilities and Electric, IRS Statistics of Income Division, U.S. Bureau of Economic Analysis, and ISER calculations

Table 4 shows all three energy sources combined. This table represents current energy costs for all Alaska households. If rural Alaskans maintain their energy consumption at 1999-2000 levels, at current prices they are facing annual costs around $7,600. For the median household, this is about 14 percent of their income. Anchorage households pay about $2,700, about 3 percent of their income. The costs for households in Kenai and Mat-Su, Juneau, Fairbanks and other communities on the road system, are intermediate between Anchorage and remote, rural Alaska.

Table 4. Total cost of gas, electricity, and heating fuel, for those who pay, at May 2008 prices

Quintile	Household Income		Anchorage	Kenai & Mat-Su	Mid-Size & Roaded	Remote Rural	Total
			Cost in Dollars				
1	$28,715 and below	average	$2,012	$3,640	$3,949	$7,437	$4,052
		median	$1,388	$2,957	$2,642	$6,317	$2,772
2	$28,716 to $52,021	average	$2,235	$4,152	$4,226	$8,034	$4,003
		median	$2,025	$3,408	$3,205	$7,095	$2,913
3	$52,022 to $78,601	average	$2,763	$4,002	$5,215	$8,824	$4,356
		median	$2,502	$3,495	$4,582	$7,885	$3,302
4	$78,602 to $119,777	average	$3,076	$3,965	$5,940	$9,220	$4,634
		median	$2,990	$3,523	$5,646	$8,077	$3,642
5	over $119,777	average	$3,723	$4,569	$6,816	$10,450	$5,317
		median	$3,532	$3,946	$6,342	$10,004	$4,285
	Total	average	$2,882	$4,038	$5,378	$8,537	$4,505
		median	$2,735	$3,465	$4,934	$7,586	$3,504
			Cost as a Percentage of 2007 Household Income				
1	$28,715 and below	average	22.7%	49.1%	38.2%	90.4%	47.3%
		median	8.7%	18.7%	17.5%	46.8%	17.2%
2	$28,716 to $52,021	average	5.5%	10.4%	10.5%	20.4%	10.0%
		median	4.7%	8.4%	7.9%	17.6%	7.1%
3	$52,022 to $78,601	average	4.4%	6.2%	8.1%	13.8%	6.8%
		median	3.9%	5.3%	7.1%	11.9%	5.1%
4	$78,602 to $119,777	average	3.2%	4.1%	6.0%	9.8%	4.8%
		median	3.2%	3.7%	5.8%	8.7%	3.8%
5	over $119,777	average	2.2%	2.8%	4.0%	6.5%	3.1%
		median	2.0%	2.3%	3.7%	6.1%	2.5%
	Total	average	6.2%	15.0%	12.4%	36.3%	13.5%
		median	3.2%	5.2%	6.0%	14.4%	4.7%

Sources: U.S. Census Bureau (IPUMS), Alaska Permanent Fund Division, Alaska Housing Finance Corporation, Regulatory Commission of Alaska, UA Cooperative Extension Service (with ISER updates), Enstar Natural Gas, Fairbanks Natural Gas, Barrow Utilities and Electric, Chugach Electric Association, Municipal Light and Power, Alaska Energy Authority, Anchorage Water & Wastewater Utility, IRS Statistics of Income Division, U.S. Bureau of Economic Analysis, Alaska Energy Authority, and ISER calculations

Appendix: Methodology

This analysis builds on a previous study, *Effects of Rising Utility Costs on Household Budgets, 2000-2006.* Please refer to the appendix of that report for a complete discussion of that methodology.[6]

All money amounts are in nominal dollars (not adjusted for inflation).

Income

Our earlier report used household-level data from the Public Use Micro Sample of the 2000 Census, and used a variety of data sources to project the households' incomes for 2005. We estimated and used different projection factors by income as well as by region to support our analysis of utility costs by income quintile. For this update our methodology was less detailed. Using our 2005 projected household incomes as the starting point, we projected household incomes to the 2007 calendar year using ratios calculated from U.S. Bureau of Economic Analysis personal income data. We calculated the per capita personal income for 2005 and 2006 from borough/census area-level BEA data[7] for each of our four regions, which we call Anchorage (Census PUMAs 101 and 102), Kenai & Mat-Su (PUMA 200), Mid-Size & Roaded (PUMA 300), and Remote Rural (PUMA 400). 2006 was the latest year for which BEA income data was available. From these income figures, we calculated a ratio of change from 2005 to 2006, and squared it to estimate the change from 2005 to 2007. In the 2000 IPUMS dataset[8], we multiplied our originally projected 2005 household incomes by these four ratios by region to obtain a projected 2007 income. We also recomputed the quintile groups based on 2007 income. Because the BEA data does not differentiate by income level, we made no adjustments in the change in household incomes by quintile – they only differ by region, although the effects of the 2005 income quintile adjustment are still present.

Heating Fuel

For this update, as for the original report, in the census category of heating fuel ("oil, coal, kerosene, wood, etc.") we projected only the cost of diesel fuel for home heating, ignoring any change in the price of other fuels that would fall into this category. We made this projection only for households who responded that "Fuel oil, kerosene, etc." was the primary heating fuel.

To project heating fuel costs to 2008, we calculated a separate ratio of price change for each region. The denominators are the 1999 estimates calculated for the original report. The numerators are projected prices assuming $130 per barrel crude oil, which is where world crude oil prices were hovering by the end of May.[9] We estimated these using four linear regressions

---

[6] Available from http://www.iser.uaa.alaska.edu/Publications/risingutilitycosts_final.pdf

[7] Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce. Table CA04. http://www.bea.gov/regional/reis/CA04fn.cfm

[8] Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander. *Integrated Public Use Microdata Series: Version 4.0* [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. http://usa.ipums.org/usa/

[9] U.S. Energy Information Administration. World Crude Oil Prices. http://tonto.eia.doe.gov/dnav/pet/pet_pri_wco_k_w.htm

(one for each region) with crude oil prices[10] as the independent variable and population-weighted[11] fuel oil prices from Alaska Housing Finance Corporation surveys as the dependent variable. The AHFC surveys used were conducted at the end of 2000, 2004, 2005, 2006, and 2007. We averaged the prices for heating oil #1 and #2. The corresponding crude oil prices were the averages of the last three months of these years. We used the coefficients from the regressions to predict fuel oil prices given $130/barrel crude oil. We then multiplied each household's annual costs of heating fuel as reported in the 2000 Census by the ratios for each region.

Gas

The cost of gas category in the 2000 Census includes other types of fuel besides natural gas (e.g. propane, but not gasoline). As in the original report, we imputed whether each household used primarily natural gas or something else. For households that did not use natural gas, we applied a propane price ratio. For households that used natural gas, we used our previous estimate of 1999 gas consumption along with current prices.

The method for estimating 2008 propane prices, based on $130/barrel crude oil, is exactly parallel to the fuel oil projection described above. We used propane prices from the same AHFC surveys and did regressions on the same crude oil prices, using the resulting coefficients to predict average 2008 propane prices for each region, then a ratio of change from 1999 to 2008.

The natural gas prices we used are the current rates, as of this writing, from Enstar, Fairbanks Natural Gas, and Barrow Utilities and Electric. Based on the estimated consumption level of each household in CCF from the original report, we calculated the cost of a year's worth of gas at the current rates according to region and whether the household used natural gas.

Electricity

For Anchorage, we obtained current electric rates from Municipal Light & Power and Chugach Electric. As before, we weighted the price of 1000 kWh in a month from each utility by the approximate number of residential customers (we did not update the customer counts). We applied the new ratio of the current price over the 1999 price to Anchorage households.

As before, for Kenai & Mat-Su (PUMA 200) and Mid-Size & Roaded (PUMA 300), we obtained data from the Cooperative Extension Service Food Cost Survey– the cost of 1000 kWh of electricity in each of the surveyed communities. The data was for the first quarter of 2008, and so was out of date. We acquired from web sites and phone calls the current rates from the utilities serving communities in these two regions. We only used the communities that had data for both 1999 and 2008. We computed unweighted average prices for the two regions and two new ratios of price change from 1999 to 2008, and applied the ratios to households in these regions.[12]

[10] U.S. Energy Information Administration. Dataset: U.S. Refiner Acquisition Cost of Crude Oil. Series: U.S. Crude Oil Imported Acquisition Cost by Refiners. http://tonto.eia.doe.gov/dnav/pet/pet_pri_rac2_dcu_nus_m.htm

[11] Due to time constraints, population used for weighting for all years but 2007 was 2000 population. We weighted 2007 survey prices by 2007 population.

[12] We omitted the Power Cost Adjustment from Alaska Electric Light & Power Company, serving Juneau, because it is unusually and temporarily high due to the recent avalanche that damaged the hydroelectric system. We also took a weighted average of the two different seasonal rates from this utility.

Rural Alaska (PUMA 400) electric rates were modeled and projected from Power Cost Equalization (PCE) monthly data[13]. We estimated the electric utility diesel purchase price with $130 oil using linear regression analysis for each community using crude oil prices[14] as the independent variable. Generator efficiency and non-fuel cost per kWh were calculated with PCE monthly data and were used with the estimated fuel cost to estimate the electric rate for each community. A weighted average for rural Alaska communities was calculated based on its number of residential customers. The model calculated all prices in real terms. To adjust the ratios back to nominal-dollar terms, we multiplied them by the ratio of the 2007 Anchorage CPI to the 1999 Anchorage CPI.

Water and Sewer

We did not project water and sewer costs for this update, and these costs are not included the total energy costs tables in this update.

[13] PCE monthly data was made available by the Alaska Energy Authority. Annual data is available at their website: http://www.akenergyauthority.org/

[14] U.S. Energy Information Administration. Dataset: U.S. Refiner Acquisition Cost of Crude Oil. Series: U.S. Crude Oil Imported Acquisition Cost by Refiners. http://tonto.eia.doe.gov/dnav/pet/pet_pri_rac2_dcu_nus_m.htm