

**Engineering Review of Carbon Dioxide Emissions and the AP Study**  
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Recently an Associated Press study was released that concluded, in part, that the higher carbon dioxide emissions by residences in some states were a direct result of their reliance on oil heat. This conclusion is not supported by facts published by the US Department of Energy, the Energy Information Administration, and the US Environmental Protection Agency. This brief report summarizes some of these important findings.

The AP study cites a recent report published by the USDOE/EIA which includes Table S4 - Residential Sector Energy Consumption Estimates, 2003. It shows estimates of carbon dioxide emissions by various sectors for each state. Based on this information, the AP study incorrectly concludes that distillate oil use was the reason for the increased carbon dioxide emissions. **It is not possible to draw accurate conclusions based on the level of detail contained in the EIA table as there is a multiplicity of fuel sources used in each state. There is simply insufficient information to reliably attribute the source of the carbon dioxide emissions.**

We conducted a review of other USDOE documents that include a detailed breakdown of fuel use for each state and in terms of trillion BTUs and combined them with carbon dioxide emission factors from the USEPA. Please see the attached table. These results clearly show that the level of per capita residential emissions is independent of percentage of #2 distillate heating oil in the mix. In fact, the main driving force is not the fuel type, but the heating demand of the location. Colder climates require more heating.

Two examples of this follow. Massachusetts and Michigan both have the same per capita residential fuel use. While the calculations show that 30 percent of Massachusetts residential carbon dioxide emissions are produced by heating oil, only 2 percent of Michigan's emissions are from oil. The majority of emissions are produced by natural gas. **Similarly, New York and Illinois have the same per capita residential carbon dioxide emissions, and their percent of carbon dioxide emissions from oil are 20 percent and 0.2 percent respectively. Clearly, heating oil is not the cause of the emissions in Illinois. Therefore, the conclusion that heating oil a primary cause of carbon dioxide emissions in oil heat states is not supported.**

One other important factor that needs to be considered is the total contribution of oil heat consumption to annual carbon dioxide emission in the US. The recent EIA publication "U.S. Carbon Dioxide Emissions from Energy Sources 2006 Flash Estimate published in May 2007 shows that in 2003 total carbon dioxide emissions in the US were 5,800 Million Metric Tons. Based on a

residential oil consumption of 905 trillion BTU in 2003, the residential oil contribution was only 65 Million Metric Tons, or 1.1 percent of the US Total. Clearly, residential oil heat is not a major contributor to annual carbon dioxide emissions. In fact, conservation activities supported by the US Department of Energy through Brookhaven National Laboratory have helped lower carbon dioxide emissions by 20 percent over the past 25 years - a reduction level that is similar to greenhouse gas emission reduction targets.

The author of this report is the former head of the Oil Heat Research Program at Brookhaven National Laboratory, which has been funded by the US Department of Energy over the past 30 years. He now supplies engineering consulting services to Brookhaven, the Oilheat Manufacturers Association, the New York State Energy Research and Development Authority, heating oil associations, and other organizations. He has also served as an expert witness in many cases over the past ten years.

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## Residential CO2 Emissions - Major Fuel Use

Ref: EIA Table S4. Residential Sector Energy Consumption  
 Estimates, 2003  
 USEPA AP-42  
 USDOE/EIA Electric Power  
 Annual

	Nat Gas		#2 oil		Wood		Electric		TOTAL			Per Capita
	Tril BTU	Million Metric Ton	Tril BTU	Million Metric Ton	Tril BTU	Million Metric Ton	Tril BTU	Million Metric Ton	Million Metric Ton	% #2 Oil	% Elec	Million Metric Ton
CT	45.9	2.5	89.1	6.4	6.5	0.7	45.0	8.1	17.6	37	46	2.8
MA	132.1	7.1	117.7	8.5	12.3	1.2	66.8	12.0	28.8	30	42	2.5
MI	385.0	20.7	12.9	0.9	14.4	1.4	114.9	20.6	43.7	2	47	2.5
NY	431.2	23.1	197.2	14.3	58.9	5.9	160.8	28.9	72.2	20	40	2.1
NJ	254.7	13.7	60.0	4.3	8.4	0.8	93.4	16.8	35.6	12	47	2.2
IL	473.2	25.4	1.4	0.1	16.6	1.7	147.3	26.4	53.6	0.2	49	2.1
MN	139.4	7.5	13.6	1.0	8.5	0.9	70.4	12.6	22.0	4	58	2.0
PA	279.1	15.0	129.6	9.4	13.3	1.3	169.4	30.4	56.1	17	54	2.1
AK	17.1	0.9	8.3	0.6	2.7	0.3	6.8	1.2	3.0	20	41	2.6

NOTE: Colder states have higher CO2 emissions regardless of fuel mix  
 (See MA/MI and NY/IL)

Attachment 1.