

DOCUMENT 5.11

Excerpt on Residential-Sector Carbon Dioxide Emissions from *Greenhouse Emissions Report*

Carbon dioxide

2.3. Residential sector carbon dioxide emissions

Residential sector carbon dioxide emissions originate primarily from:

- Direct fuel consumption (principally, natural gas) for heating and cooking
- Electricity for cooling (and heating), appliances, lighting, and increasingly for televisions, computers, and other household electronic devices (Table 8).

Energy consumed for heating and cooling in homes and businesses has a large influence on annual fluctuations in energy-related carbon dioxide emissions because of variability in the weather as measured by heating and cooling degree-days. In 2009, heating degree-days were down slightly from 2008 (Figure 11). Although annual changes in cooling degree-days have a smaller impact on energy demand, the 4-percent decrease in 2009 helped to reduce emissions further.

In the longer run, residential emissions are affected by population growth, income, and other factors. From 1990 to 2009:

- Residential sector carbon dioxide emissions grew by an average of 1.0 percent per year.
- U.S. population is estimated to have grown by an average of about 1.1 percent per year.
- Income per capita (measured in constant dollars) grew by an average of 1.4 percent per year.
- Energy efficiency improvements for homes and appliances offset much of the growth in the number and size of housing units. As a result, direct emissions of carbon dioxide from the consumption of petroleum, coal, and natural gas in the residential sector in 2009 were up by only 0.9 percent from the 1990 level.

Residential sector carbon dioxide emissions, 1990, 2005, 2008, and 2009

	1990	2005	2008	2009
Estimated emissions (million metric tons)	963.4	1,261.5	1,229.0	1,162.2
Change from 1990 (million metric tons)		298.1	265.6	198.8
(percent)		30.9%	27.6%	20.6%
Average annual change from 1990 (percent)		1.8%	1.4%	1.0%
Change from 2005 (million metric tons)			-32.5	-99.3
(percent)			-2.6%	-7.9%
Change from 2008 (million metric tons)				-66.8
(percent)				-5.4%

Figure 11. Annual changes in U.S. heating degree-days and residential sector carbon dioxide emissions from direct fuel combustion, 1990-2009

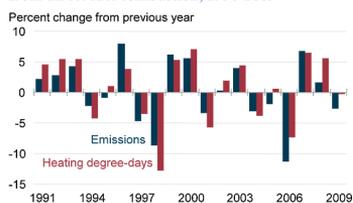


Table 8. U.S. carbon dioxide emissions from residential sector energy consumption, 1990-2009 (million metric tons carbon dioxide)

Fuel	1990	1995	2000	2003	2004	2005	2006	2007	2008	2009
Petroleum										
Liquefied petroleum gas	22.2	24.9	35.0	34.3	32.3	32.3	28.1	30.5	34.9	36.5
Distillate fuel	71.6	66.2	66.2	66.2	67.6	62.5	52.1	53.1	48.5	44.5
Kerosene	4.6	5.4	6.8	5.1	6.1	6.1	4.8	3.2	1.5	1.9
Petroleum subtotal	98.4	96.5	108.0	105.6	106.0	100.9	85.0	86.8	84.9	82.9
Coal	3.0	1.7	1.1	1.2	1.1	0.8	0.6	0.7	0.7	0.6
Natural gas	238.3	262.9	270.8	276.4	264.3	262.4	237.5	257.3	265.8	259.1
Electricity ^a	623.7	678.1	805.2	846.9	856.4	897.3	868.9	897.2	877.5	819.5
Total	963.4	1,039.1	1,185.1	1,230.1	1,227.8	1,261.5	1,192.0	1,242.0	1,229.0	1,162.2

^aShare of total electric power sector carbon dioxide emissions weighted by sales to the residential sector.
Note: Totals may not equal sum of components due to independent rounding.