

# Greenhouse Gases Chart

A day will come when our children and grandchildren will look back and they'll ask one of two questions. Either they will ask: "What in God's name were they doing?" Or they may look back and say: "How did they find the uncommon moral courage to rise above politics and redeem the promise of American democracy?"

— Al Gore

n/a = not applicable n/k = not known	Pre-Industrial Concentration (1860)	Concentration in 2005 <sup>1</sup>	Average Atmospheric Lifetime <sup>2</sup>	Growth Rate per Year
Water vapor	Variable 1–3%	Variable 1–3%	Few days	0.2% <sup>5</sup>
Carbon dioxide CO <sub>2</sub>	280 ppm	385 ppm (2008) Rising by 2 ppm per year	Very approx: 50% 30 years 30% 300 yrs, 20% 3,000 yrs	3%
Black carbon	0	n/a	5.5 days	n/k
Methane CH <sub>4</sub> <sup>12</sup>	715 ppb	1774 ppb	8.4 years	0.6%
Tropospheric ozone O <sub>3</sub>	25 ppb	34 ppb	Hours/days	1%
CFC-12	0	542 ppt	100 years	Decline
HCFC-22	0	174 ppt	12 years	Decline
HFC-23	0	14 ppt <sup>15</sup> (+0.55ppt pa)	270 years	5.1%
PFC-14 — CF <sub>4</sub>	0	79 ppt	50,000 years	10%
Sulfur hexafluoride SF <sub>6</sub>	0	5.22 ppt	3,200 years	10%
Fluorinated ethers (HFE-125)	0	0.16 ppt	136 years	n/k
Nitrous oxide N <sub>2</sub> O	270 ppb	319 ppb	114 years	0.26%
<b>TOTAL</b>				
Aerosols	>0	Variable	Hours/days	n/k <sup>17</sup>
Surface albedo changes	n/a	n/a	n/a	n/a
Solar irradiance	n/a	n/a	10 to 100 yrs	n/a

<b>Anthropogenic Sources (from Human Activity)</b>	<b>Global Warming Potential (GWP) over 100 Years<sup>3</sup></b>	<b>GWP over 20 Years</b>	<b>Radiative Forcing Watts per sq. meter<sup>4</sup></b>	<b>Share of Cause of Climate Change based on radiative forcing</b>
All of the below <sup>6</sup>	n/a <sup>7</sup>		n/a	n/a
Gas (16%), Oil (33%), Coal (32%) Cement (7.4%) <sup>8</sup> , Deforestation (16%) <sup>9</sup>	1	1	+1.66	44%
Fossil fuels (40%) Open biomass burning (42%) Residential traditional biofuel burning (18%)	1,650 <sup>10</sup>	4470	+0.80 <sup>11</sup>	21%
Fossil fuel extraction (26%) Livestock digestion (35%), Rice paddies (8%) Landfills (12%), Animal manure/slurry (7%) Biomass burning (12%)	25	72	+0.48	13%
Fossil fuel use (50%) Forests/biomass burning (25%), Methane (25%) <sup>13</sup>	n/a	n/a	+0.35	9%
Liquid coolants, foams	10,900	11,000	} +0.34 <sup>14</sup>	
Liquid coolants	1,810	5,160		
Liquid coolant CFC & HCFC substitutes	14,800	12,000		
Aluminum manufacture (59%) Solvents and other (26%), Plasma etching (15%)	7,390	5,210		
Magnesium production Dielectric fluid	22,800	16,300		
Manufacturing of fluoro-chemicals <sup>16</sup>	14,900	13,800		
Nitrogen fertilizers & manures (70%) Transportation (14%), Industrial processes (7%)	298	289	+0.16	4%
<b>TOTAL</b>			<b>+3.79</b>	<b>100%</b>
Fossil fuels, Biomass fires, Volcanoes	n/a		-0.5 <sup>18</sup>	
Deforestation (-0.2), Black carbon on snow (+0.1)	n/a		-0.1 <sup>19</sup>	
n/a	n/a		+0.12	