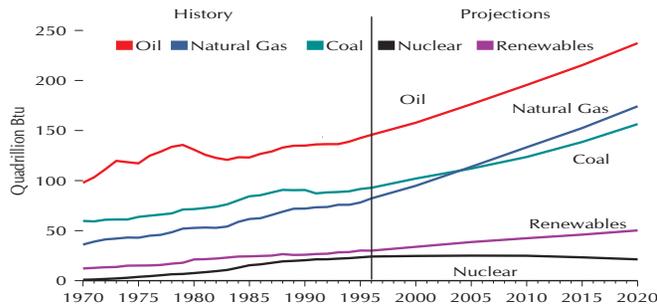
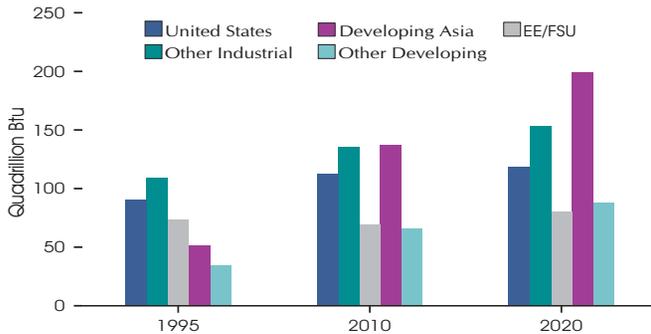


World Energy Consumption by Fuel



- In the *IEO98* reference case, world energy consumption is projected to increase by 75 percent between 1995 and 2020, reaching 639 quadrillion British thermal units (Btu). All energy sources are expected to grow over the projection period except nuclear.
- Natural gas is the fastest growing primary energy worldwide, increasing by 3.3 percent annually (on a Btu basis) over the projection period. Indeed, natural gas surpasses coal by 2005; by 2020, gas use is 11 percent higher than coal use. Much of the expected gas increment fuels electricity generation, particularly in the industrialized countries, where natural gas is used to replace the other, relatively more carbon-intense fossil fuels.
- Oil demand grows by an average annual rate of 2 percent, resulting in an increase of more than 45 million barrels per day between 1995 and 2020. In the industrialized world, increases in oil use will be primarily in the transportation sector; in the developing world oil use increases in all end-use sectors.

World Energy Consumption by Region



- Although the economic downturn in Asia that began in mid-1997 and continues into 1998 has lowered expectations for near-term growth in the region, almost half the world's projected increase in energy consumption will be in developing Asia.
- Strong long-term economic growth in the Asia Pacific is expected to result in improved standards of living which, in turn, means increased energy use for a variety of residential and commercial purposes, as well as personal transportation. By 2020, the projected energy consumption in developing Asia surpasses that of all North America by 36 percent.

World Energy Consumption and Carbon Emissions, 1995-2020

Fuel & Region	Energy Consumption							Carbon Emissions			
	Quadrillion Btu			Million Tons Oil Equivalent			Annual Percent Change 1995-2020	Million Metric Tons			
	1995	2010	2020	1995	2010	2020		1990	1995	2010	2020
By Fuel											
Oil.....	142.5	195.5	237.3	3,590	4,927	5,979	2.1	2,547	2,562	3,327	4,040
Natural Gas.....	78.1	133.3	174.2	1,969	3,360	4,390	3.3	1,009	1,095	1,869	2,438
Coal.....	91.6	123.6	156.4	2,307	3,114	3,942	2.2	2,287	2,317	3,110	3,947
Nuclear.....	23.3	24.9	21.3	587	626	536	-0.4	—	—	—	—
Renewables.....	30.1	42.4	50.2	757	1,067	1,266	2.1	—	—	—	—
Total.....	365.6	519.6	639.4	9,212	13,095	16,112	2.3	5,786	5,841	8,330	10,447
By Region											
North America.....	108.0	136.5	147.1	2,723	3,440	3,706	1.2	1,550	1,629	2,105	2,313
Western Europe....	64.8	79.0	88.1	1,632	1,991	2,221	1.2	971	925	1,101	1,239
Industrial Asia.....	26.3	32.1	36.3	663	809	915	1.3	364	379	461	514
EE/FSU.....	53.2	69.0	80.4	1,340	1,738	2,026	1.7	1,290	866	1,072	1,223
Developing Asia....	71.8	137.4	199.4	1,811	3,461	5,026	4.2	1,065	1,427	2,603	3,835
Middle East.....	13.9	19.9	25.5	350	502	644	2.5	194	229	322	409
Africa.....	10.7	15.7	19.8	270	397	499	2.5	178	192	276	341
Central & South America.....	16.8	30.0	42.7	423	756	1,076	3.8	174	194	391	574

Sources: 1995: Energy Information Administration (EIA), *International Energy Annual 1996*, DOE/EIA-0219(96) (Washington, DC, February 1998). Projections: EIA, World Energy Projection System (1998). Note: Totals may not equal sum of components due to independent rounding. EE/FSU= Eastern Europe and Former Soviet Union.

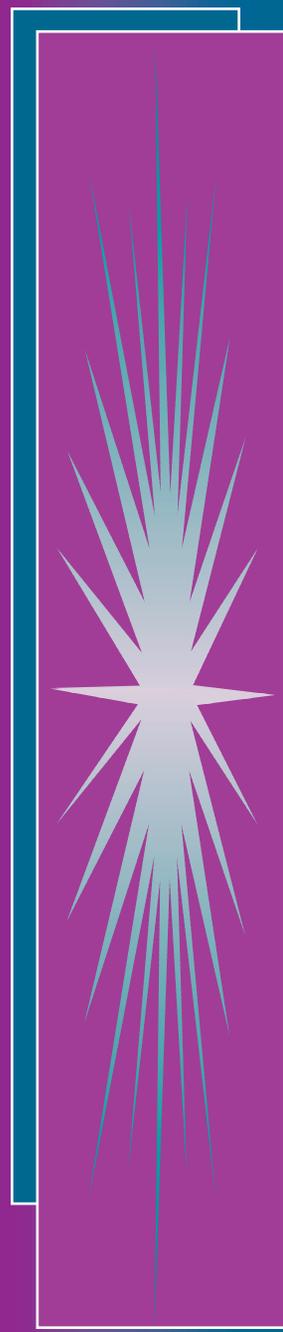
Carbon Emissions in the Annex I, 1990 and 2010, and the Effects of the Kyoto Protocol in 2010

Country	Million Metric Tons Carbon			Percent Change	
	1990 Emissions	2010 Baseline Projection	2010 Kyoto Target	From 1990	From 2010 Baseline
Annex I Industrialized Countries	2,807	3,535	2,618	-7	-26
United States	1,346	1,803	1,252	-7	-31
Western Europe	971	1,101	893	-8	-19
Annex I Transitional Economies^a	1,290	1,072	1,268	-2	+18
FSU	991	792	991	0	+25
EE	299	280	277	-7	-1
Total Annex I Countries	4,097	4,607	3,886	-5	-16

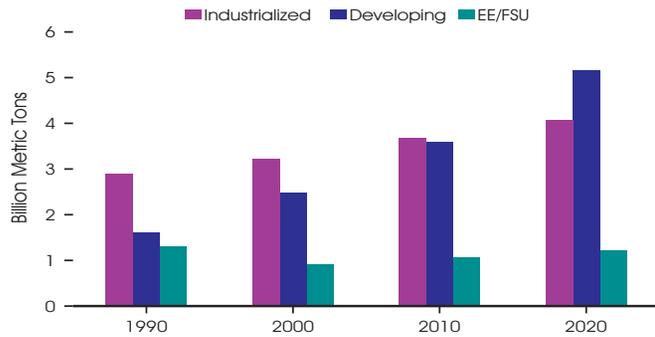
^a Includes non-Annex I countries. Annex I countries in the EE/FSU currently account for 87 percent of the region's total emissions.

International Energy Outlook 1998

With Projections Through 2020

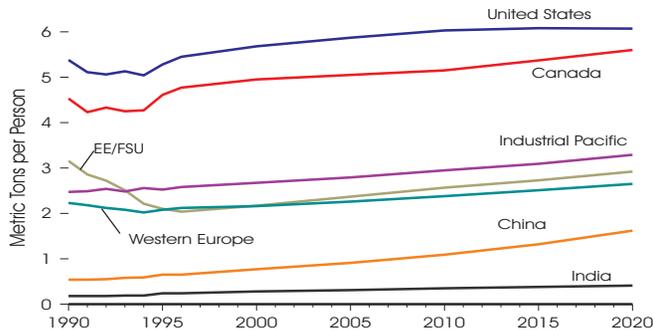


World Carbon Emissions by Region



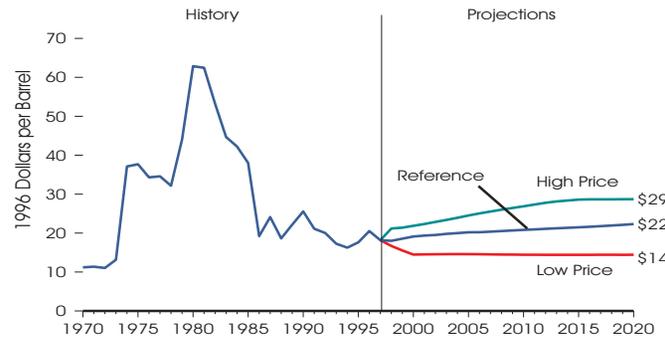
- If world energy consumption reaches the levels expected in the *IEO98* reference case, carbon emissions will exceed 1990 levels by 44 percent in 2010, and by 81 percent in 2020. Total world carbon emissions are expected to increase by 4.7 billion metric tons between 1990 and 2020.
- By 2010, emissions in the developing world are projected to be nearly equal to those of the industrialized world. If the Annex I countries that are parties to the Kyoto Climate Change Protocol were able to achieve the proposed target reductions, the forecast for their emissions would be altered; but worldwide emissions levels would continue to rise by 32 percent between 1990 and 2010.

Carbon Emissions per Capita in Selected Countries and Regions



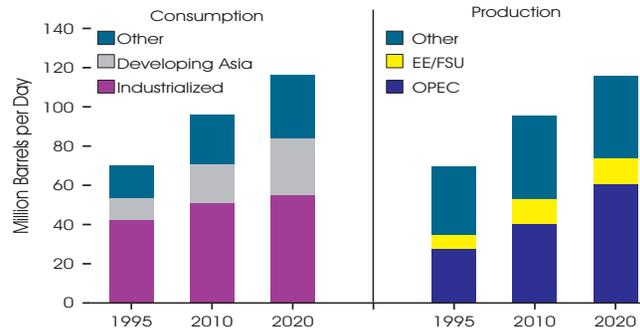
- Per capita carbon emissions for the Annex I countries increase from 3.2 metric tons of carbon per person in 1990 to 3.7 metric tons per person in 2020.
- In contrast, the 1990 level for non-Annex I countries was 0.4 metric tons, and the projected 2020 level is 0.8 metric tons.
- Within the Annex I countries, the United States and Canada have the highest per capita emissions levels throughout the forecast, reaching 6.0 and 5.6 metric tons per person in 2020, respectively. However, the growth rate of per capita emissions in both countries is projected to be fairly flat after 2000. Outside the Annex I countries per capita emissions are projected to increase more rapidly. In China, per capita emissions in 2020 are more than triple their 1990 level in the *IEO98* reference case, reflecting fast-paced industrialization based largely on fossil fuel consumption over the forecast period.

World Oil Prices



- Developments in the world's oil market have been particularly unusual. Recent oil prices have been weak—with prices running at a ten year low in spring 1998 before Saudi Arabia, Mexico, and Venezuela agreed to cut production levels. The Organization of Petroleum Exporting Countries (OPEC) increased oil production quotas for its members in late 1997 and the United Nations increased the amount of oil Iraq is allowed to export.
- The long-term trend for world oil prices in this year's projection shows oil prices rising slowly in real terms, reaching about \$22 per barrel (in constant 1996 U.S. dollars) in 2020 from about \$17 at the end of 1997.

World Oil Consumption and Production by Region



- Political, economic, and environmental circumstances will be the most influential factors affecting the development of world oil markets. Settlement of Iraqi sanctions, development of infrastructure needed to market Caspian Sea oil, and the future behavior of OPEC will all influence oil markets in the long-term. Expansion of non-OPEC oil production is expected to continue in the short-term, however, OPEC increases its share of the world oil production from 39 percent in 1996 to 52 percent in 2020.
- Total world oil consumption exceeds 116 million barrels per day by 2020 in the reference case. Although the industrialized countries continue to be the world's major oil consumers throughout the forecast, oil consumption in developing Asia grows to nearly 29 million barrels per day, 2.5 times greater than the region's 1995 level.

For Further Information.....

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