



The Global Context for Energy and the Domestic Energy Situation

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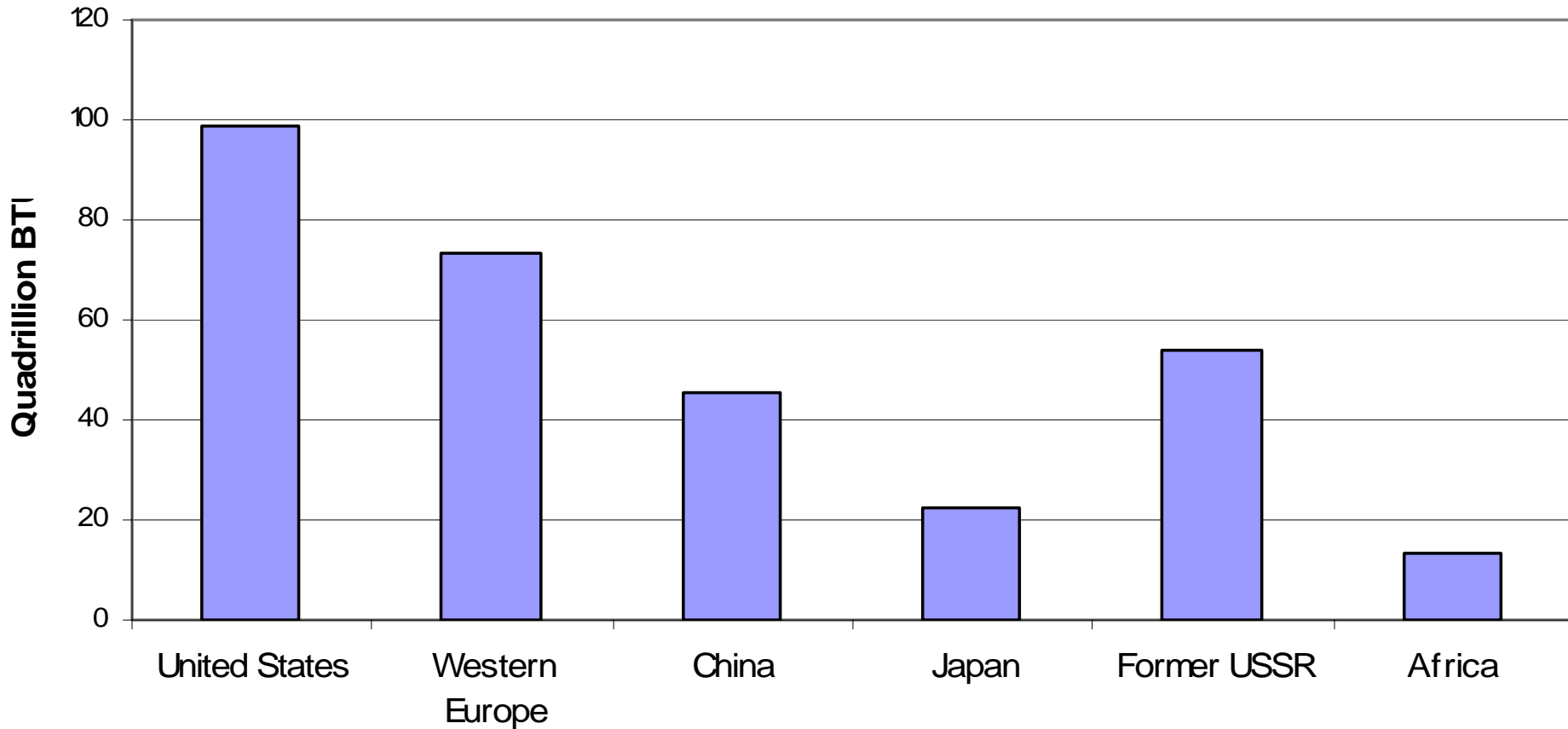
The US Energy Picture

- US Energy production and consumption
- Biomass energy, particularly ethanol, and its prospects in the US
- Energy policy links to agricultural policy

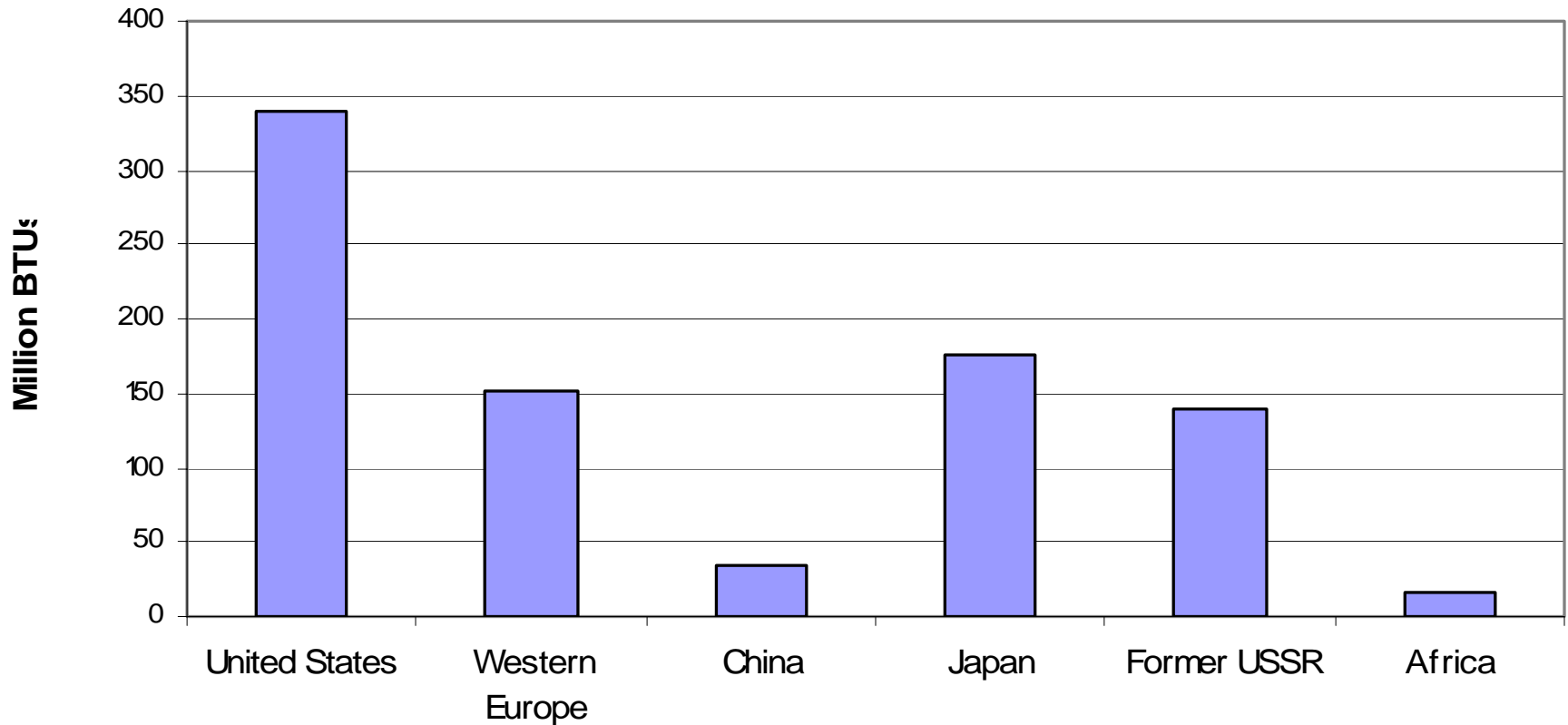
U.S. Energy and Ethanol

- U.S. is the world's largest energy consumer (in total and per capita)
- U.S. imports over 60% of our oil
- 40% of our energy consumption is oil
- Ethanol is now about 2.5% of our gasoline consumption

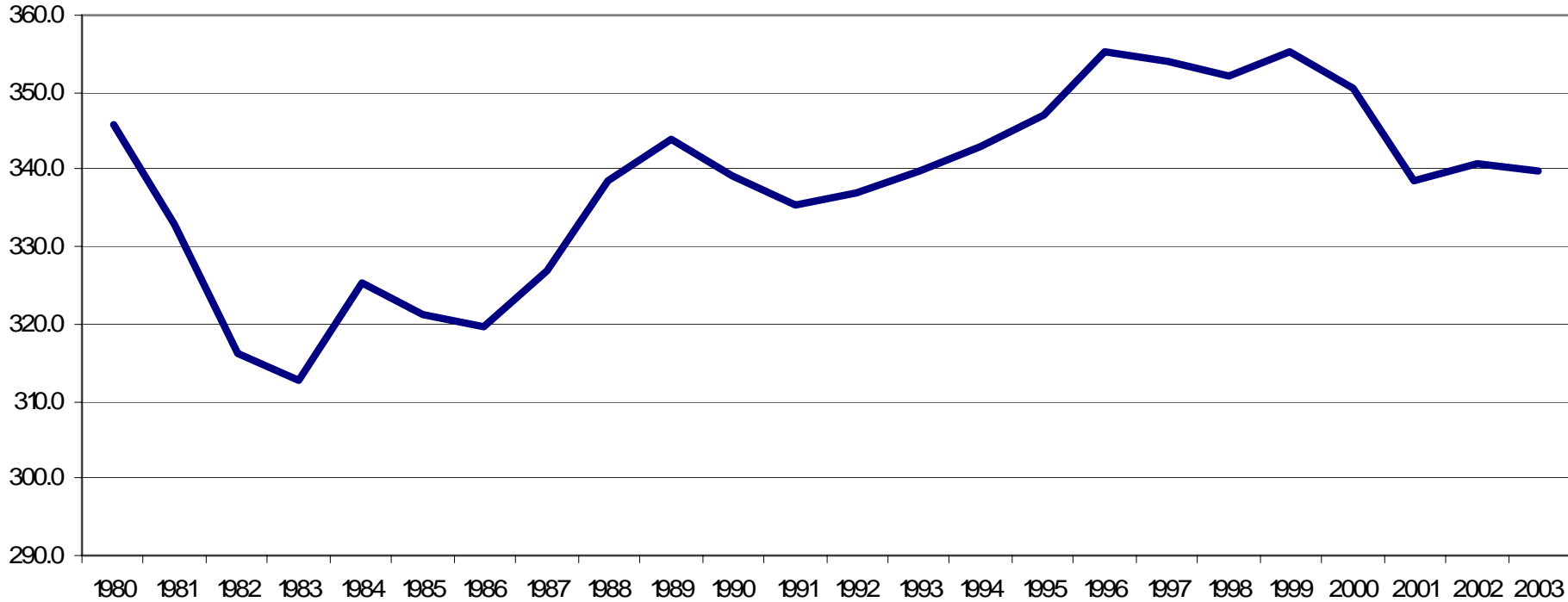
Total Energy Consumption - 2003



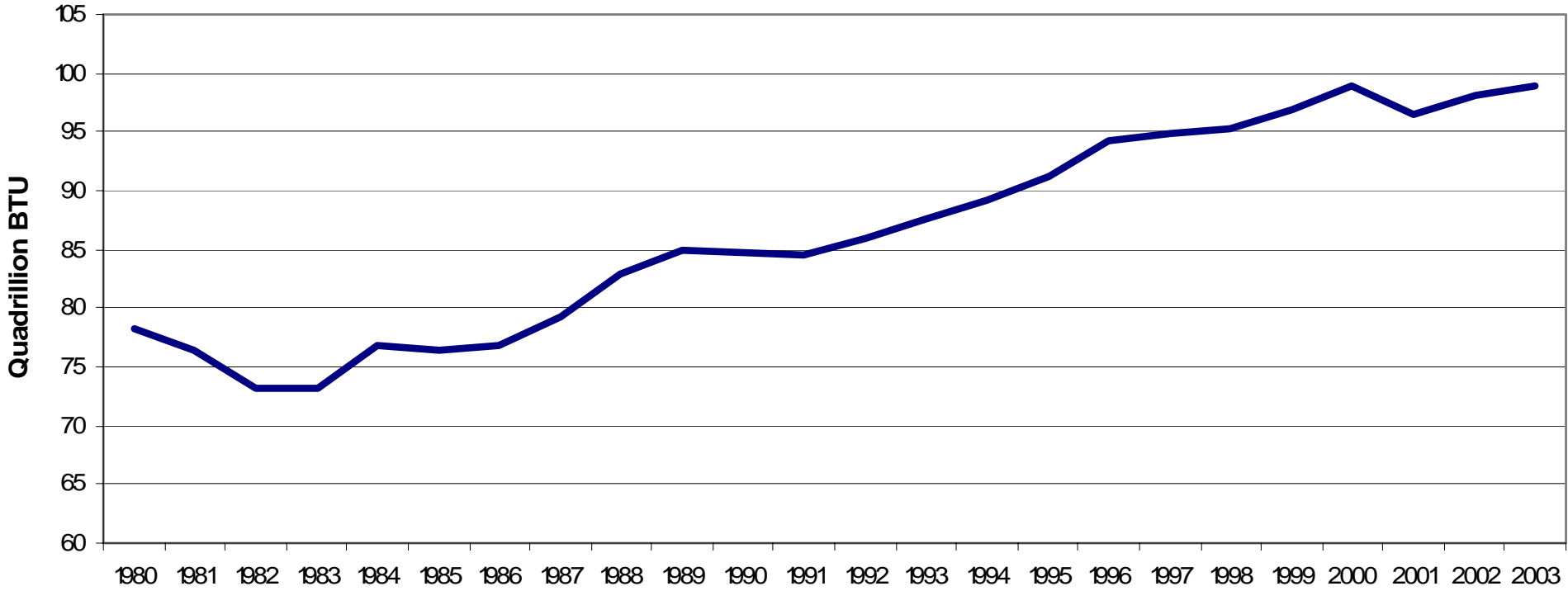
Per Capita Energy Consumption - 2003



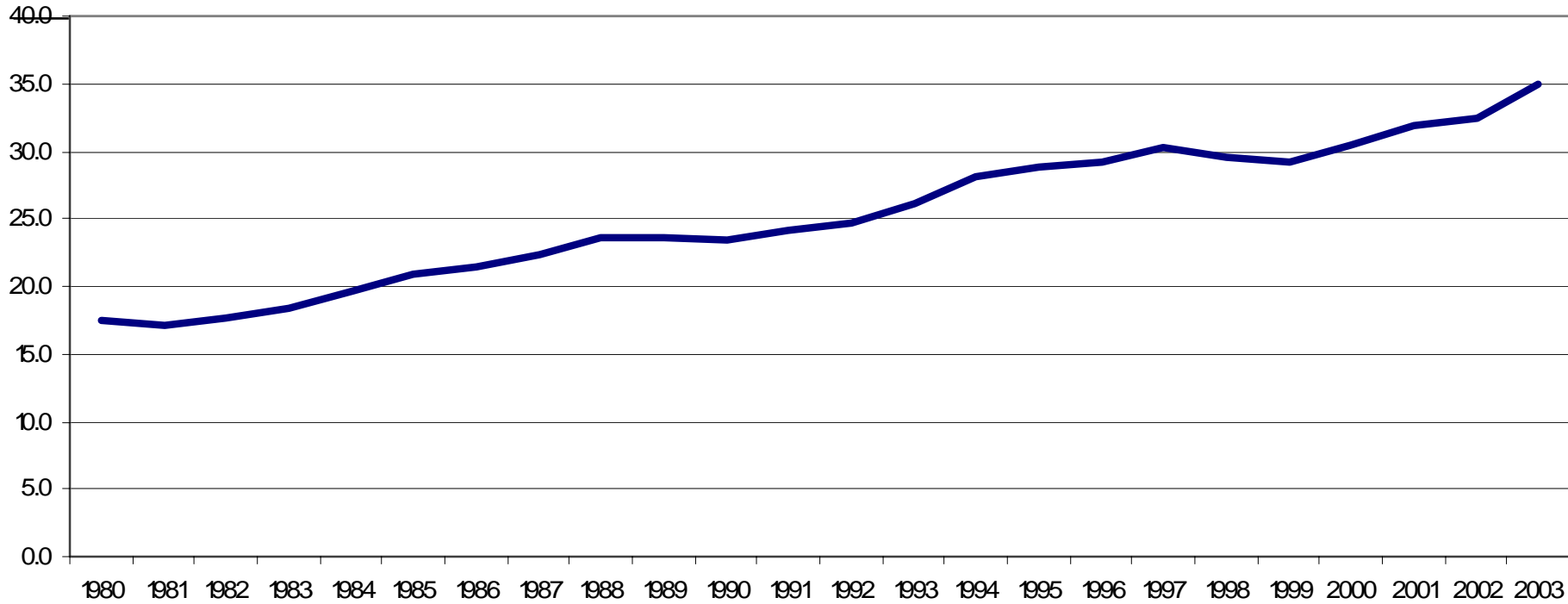
Evolution of US Per Capita Energy Consumption



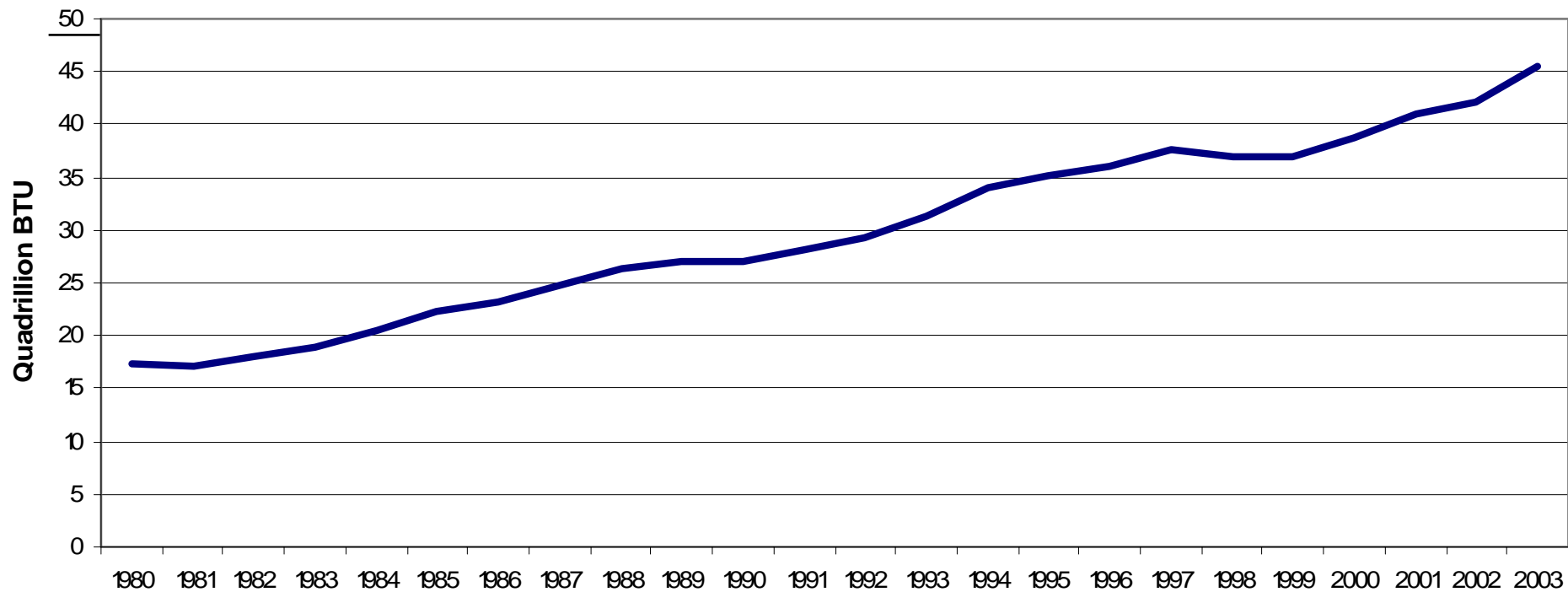
Evolution of US Energy Consumption



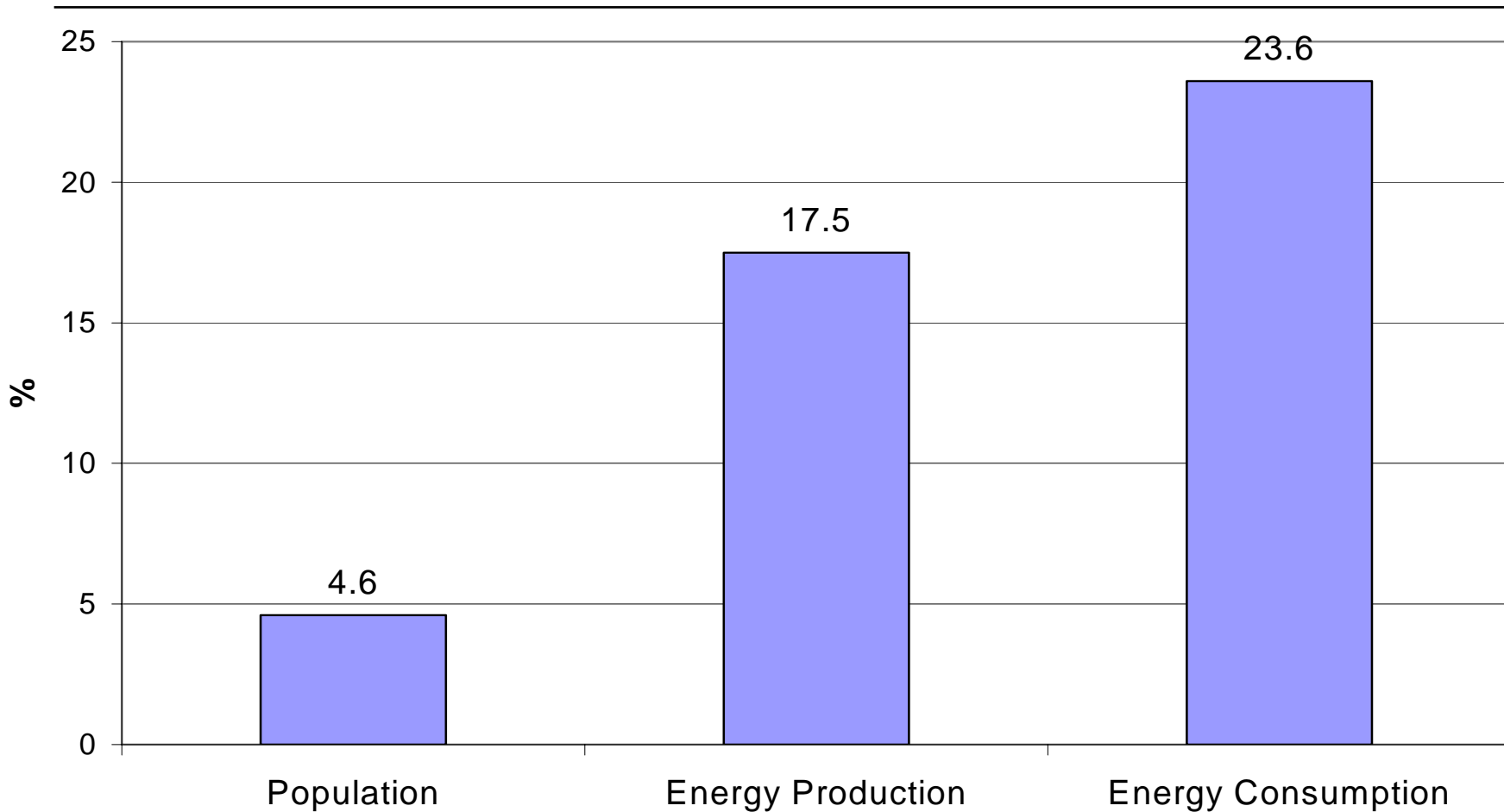
Evolution of Chinese Per Capita Energy Consumption



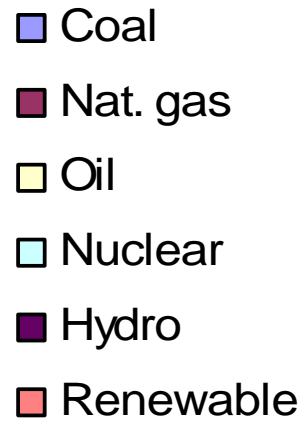
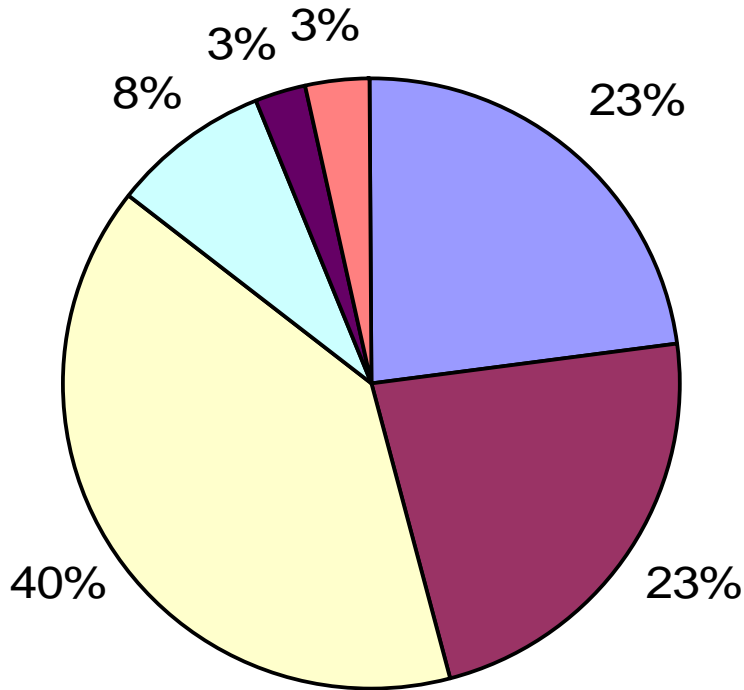
Evolution of Chinese Energy Consumption



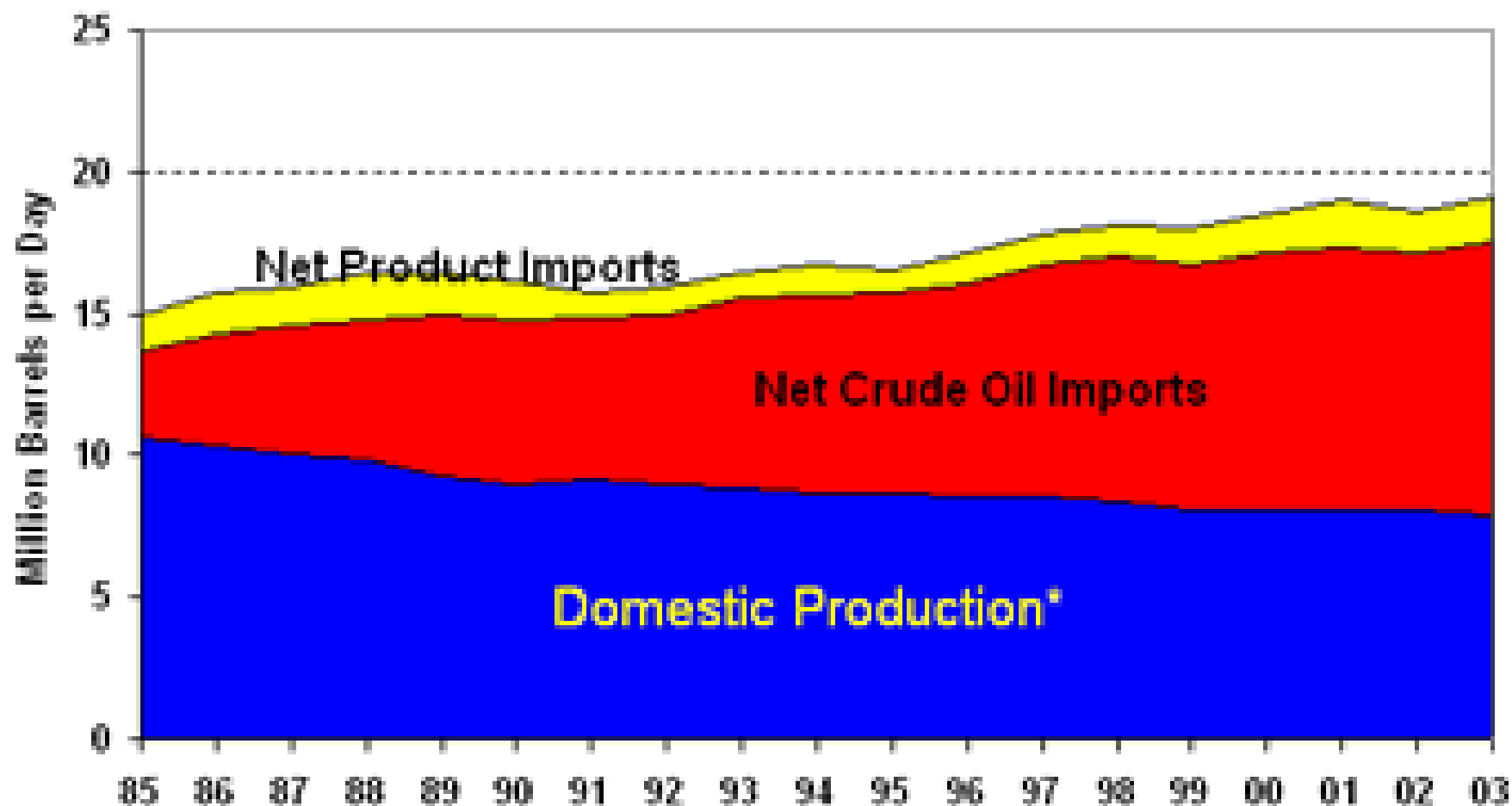
U.S. Share of World



U.S. Energy Consumption 2003

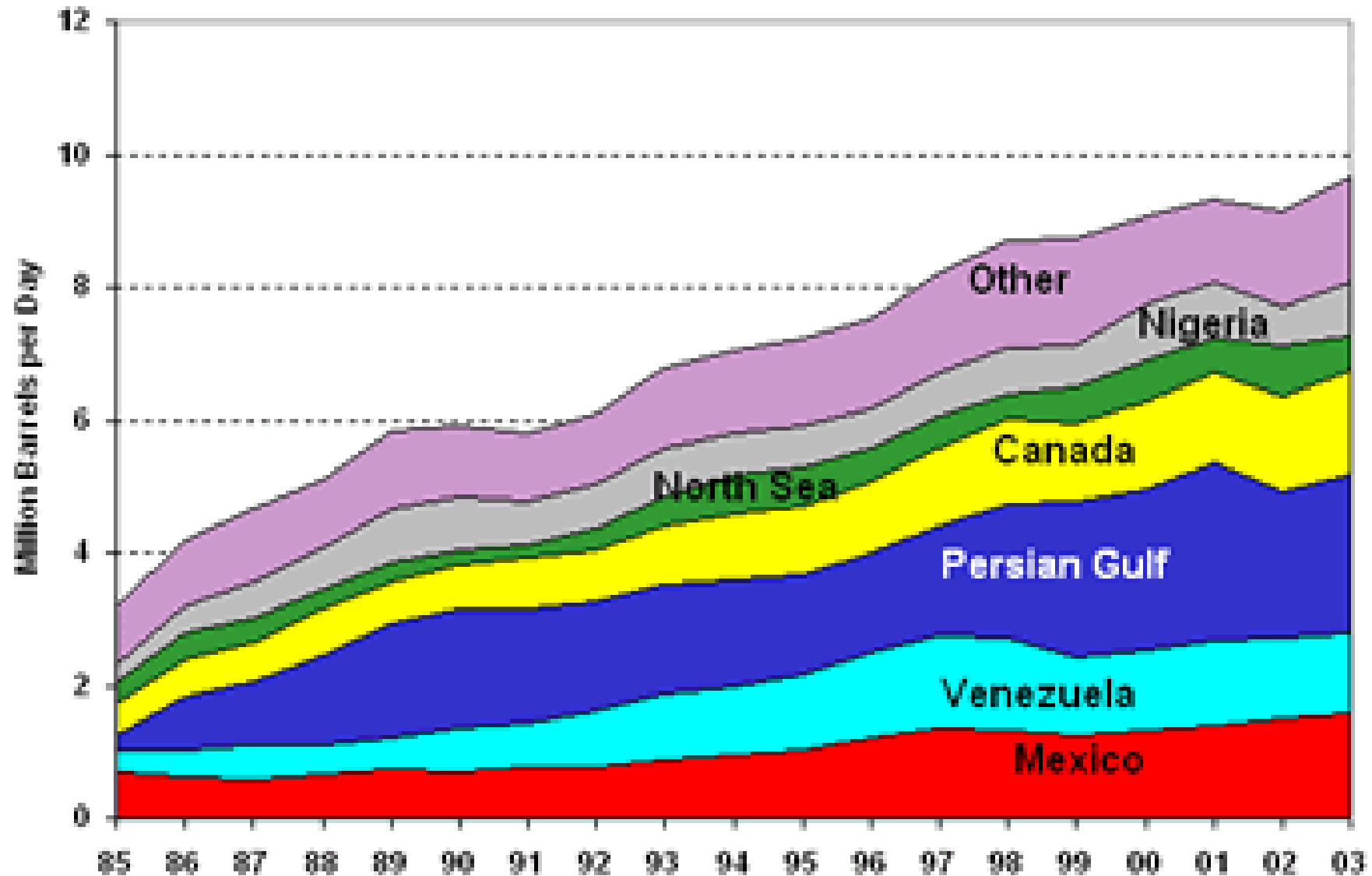


U.S. Oil Production and Imports

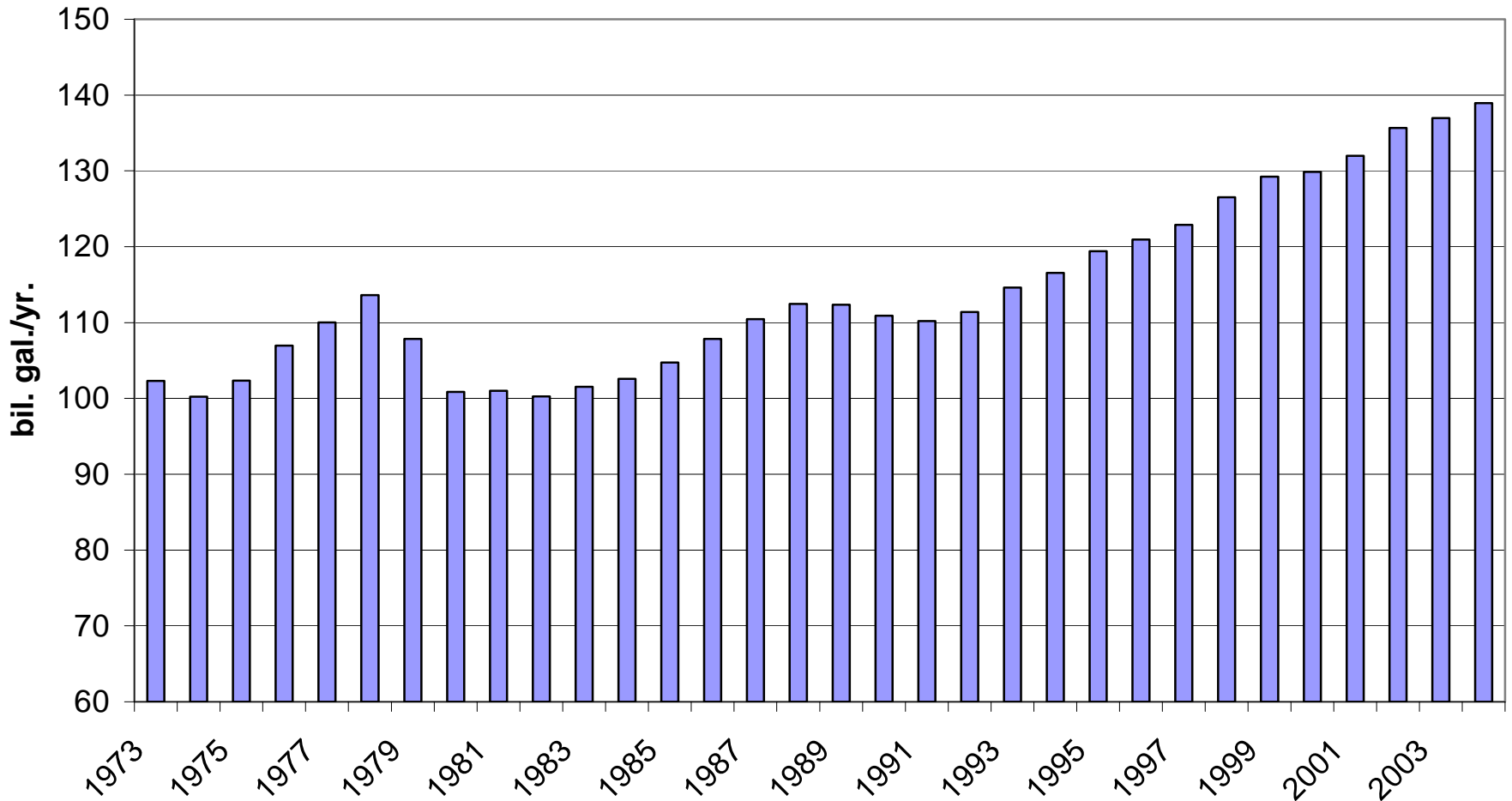


*Domestic production includes crude oil, natural gas liquids, and other hydrocarbons and alcohol production, but does not include refinery gain

U.S. Crude Oil Imports by Source



Annual Gasoline Consumption



Some Definitions

- Ethanol – ethyl alcohol, produced through fermentation of starch and sugars. In the U.S., about 90% comes from corn.
- Ethanol is used as a **gasoline extender**, **octane enhancer**, and **oxygenate**,
 - Extender – just an addition to fuel supply
 - Octane enhancer – increases gasoline octane
 - Oxygenate – adds oxygen to make gasoline burn cleaner

Additional Information

- Ethanol has higher octane than gasoline, but it has lower energy content.
- Ethanol blends get slightly less mileage than equivalent gasoline.
- Ethanol blends burn cleaner than standard gasoline because of the increased oxygen, but may increase evaporative emissions
- Many states have now banned MTBE, so ethanol is becoming the major oxygenate

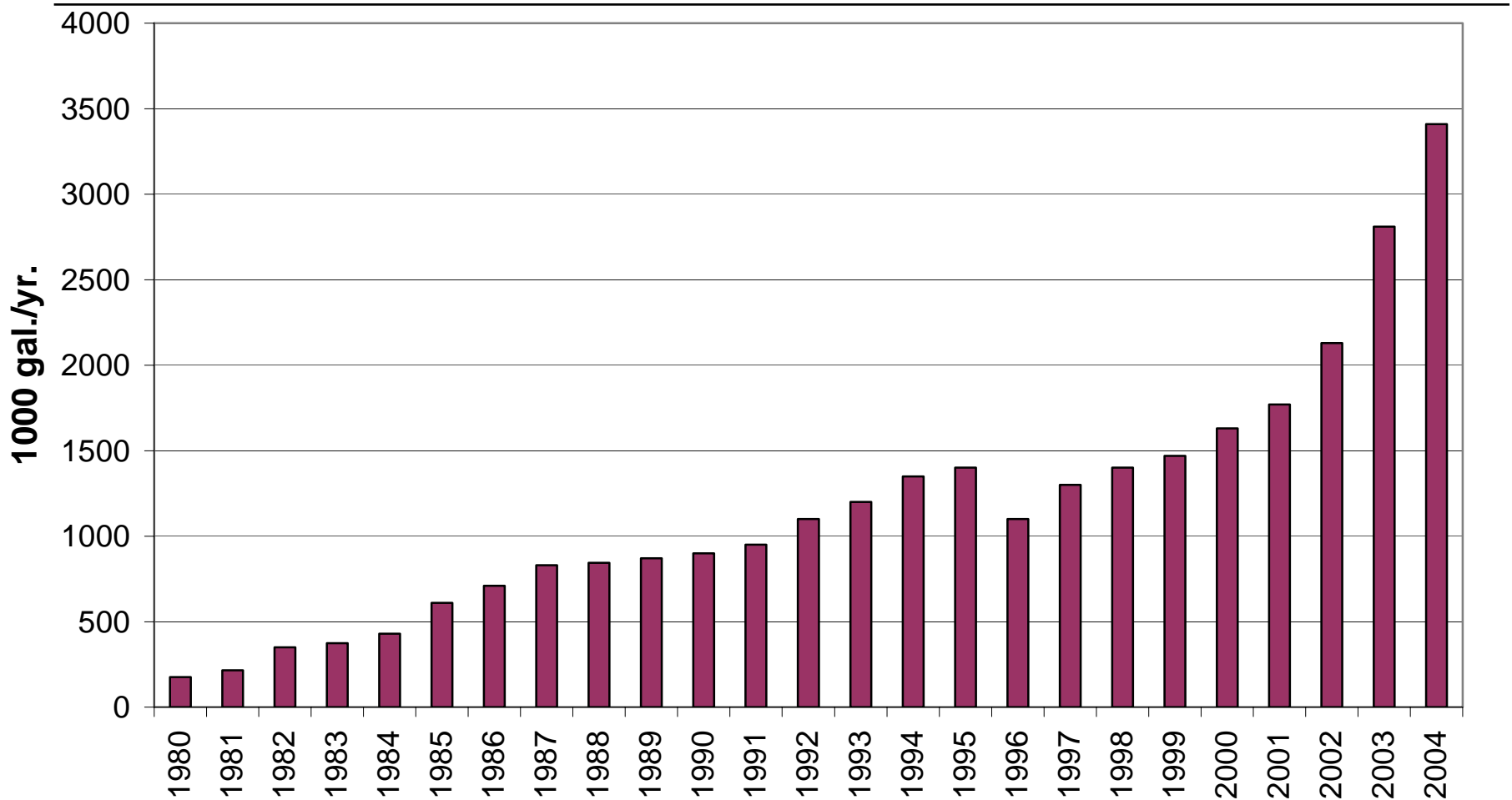
Key Legislation

- Energy Tax Act of 1978, provided a 54 cent per gallon subsidy for ethanol.
- Clean Air Act of 1990 mandated more oxygen in fuels (ethanol has more oxygen than standard gasoline).
- American Jobs Creation Act of 2004 extended the 51 cent per gallon federal subsidy through 2010 and changed the subsidy mechanism so it no longer comes from the gasoline tax.
- Energy Policy Act of 2005 – renewable fuels standard and eliminated oxygen requirement

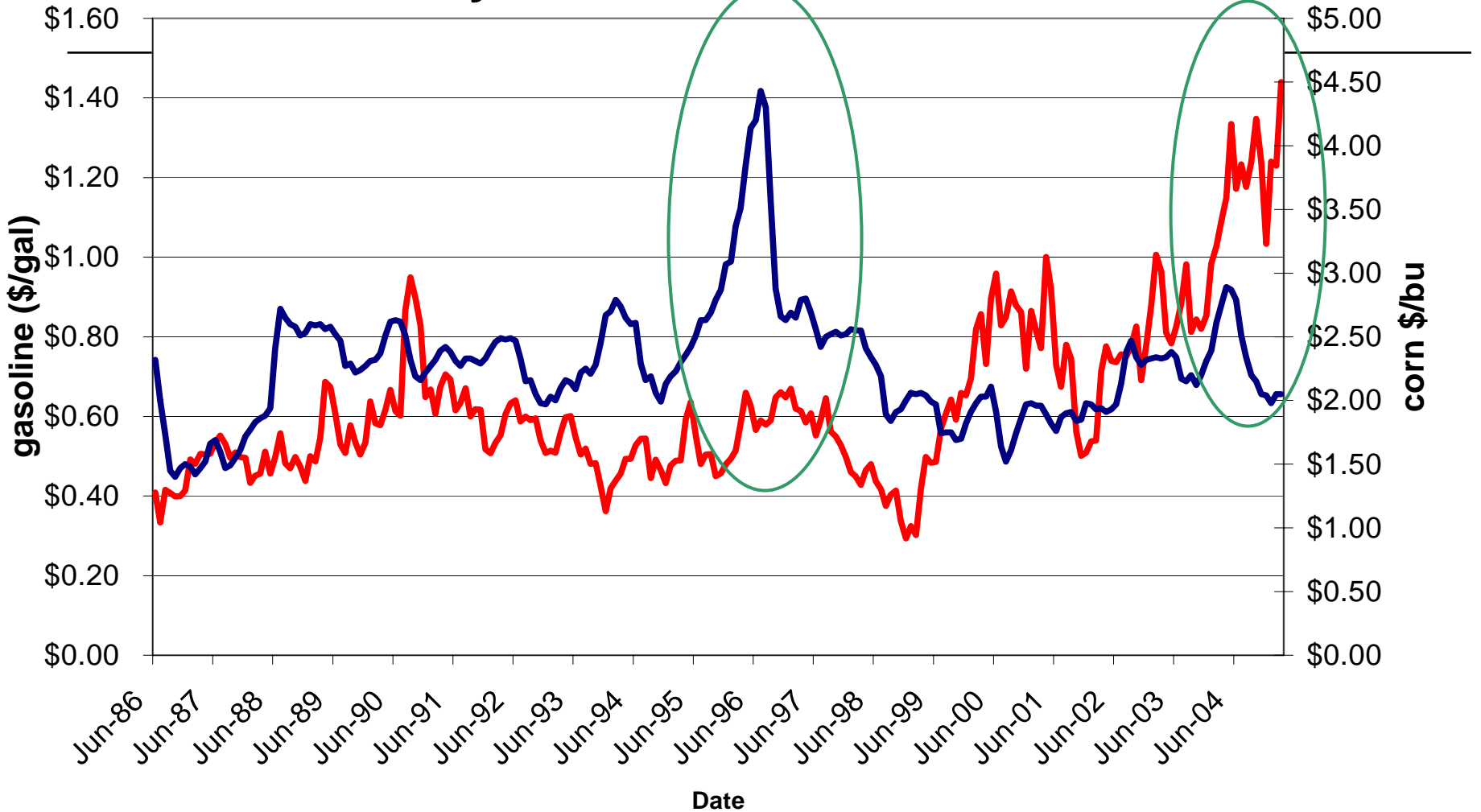
Energy Policy Act of 2005

- Energy Policy Act of 2005 – renewable fuels standard that starts at 4 bil. gal. in 2006 and goes to 7.5 bil. In 2012
- Will not reduce gasoline prices
- Will not reduce dependence on foreign oil
- Will not stimulate energy conservation
- Does provide some funding for research (authorized but not appropriated)

Ethanol Production



Monthly Corn and Gasoline Prices



— Monthly Gasoline Spot Prices — Monthly Corn Prices

Ethanol Economics

- Until very recently, ethanol has not been economic without a government subsidy.
- However, with \$60 oil and \$2.25 corn, ethanol is about break-even with no subsidy.
- In addition, some states provide subsidies as well
- Under current conditions, ethanol is profitable with market conditions plus subsidies
- Renewable fuel standard should provide a market for the product up to the RFS limit

Corn Use for Ethanol

- Currently about 1.3 bil. bu. of corn is used for ethanol
- That could double in the next 5-7 years
- With more corn used for ethanol, we might expect:
 - More corn to be produced and higher prices
 - Less corn to be exported
 - And maybe less corn to be fed

Ethanol Impacts

- Currently the ethanol subsidy costs about \$1.75 billion per year.
- Over the past 25 years, ethanol has been an industry that exists solely due to government subsidies. Today, however, it could be viable without subsidies so long as oil prices stay high and corn prices low.
- If the subsidies and the RFS continue, corn use for ethanol will increase to the 7.5 billion gallon standard by 2012.

Ag and Energy Policy Links

- With 15 percent or more of the corn crop going to ethanol, there likely will be upward price pressure on corn
 - Costs of agricultural subsidies could fall
 - Subsidizing ethanol is WTO legal, whereas direct corn subsidies are not likely to be

Ag and Energy Price Links

- Natural gas prices are likely to remain high, so fertilizer and other gas intensive products will have higher costs
- Diesel prices have been higher than gasoline for the past year, and that is likely to continue, particularly if we have a cold winter and air traffic remains high
- Ag energy intensity in general is low