

- Petroleum Demand and World Reserves
- Green House Gas Constraint

Let's discuss the future of IC engines in the context of the world situation.

1. World Petroleum Demand - Current - Approximate

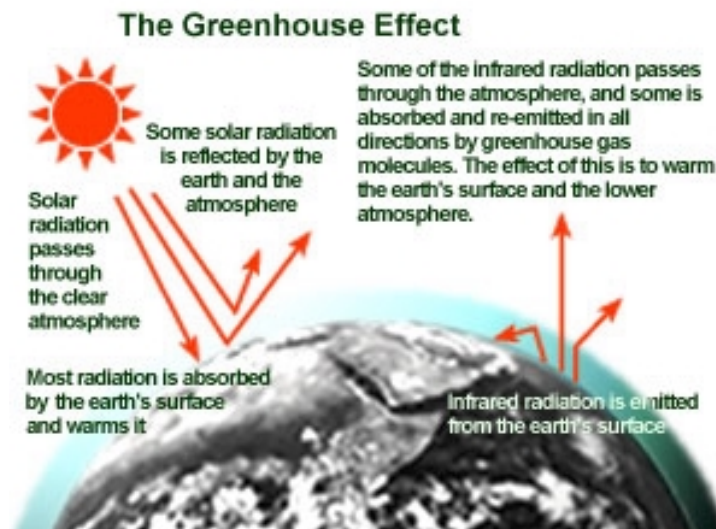
- USA - about 20×10^6 barrels/day
- UK - about 2×10^6 barrels/day
- Germany - about 3×10^6 barrels/day
- World - about 75×10^6 barrels/day

2. Reserves of Petroleum (Not including natural gas or coal)

- Saudi Arabia - about 270×10^9 barrels
- Iraq - 110×10^9 barrels
- Kuwait - 100×10^9 barrels
- USA - about 50×10^9 barrels
(We have about 0.50×10^9 barrels in Strategic Reserve)
- World - about 1000×10^9 barrels proven reserves
(Enough for about 35 years at current level of demand. Why is this a deceptive prediction?)

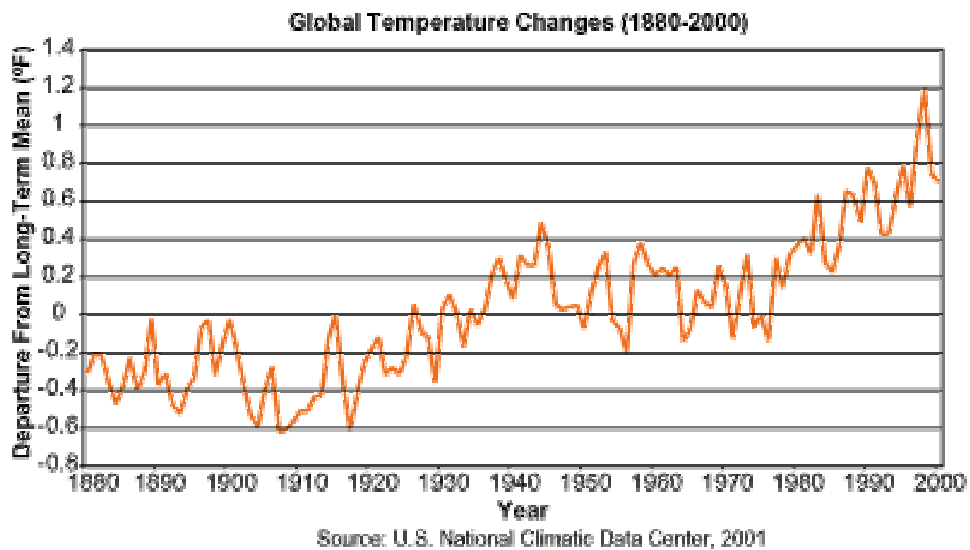
Problem: Political uncertainty regarding short term availability.
Discuss: Implications to an engineer working in an IC related industry.

3. Carbon Dioxide Emission - Global Warming Concern



EPA website

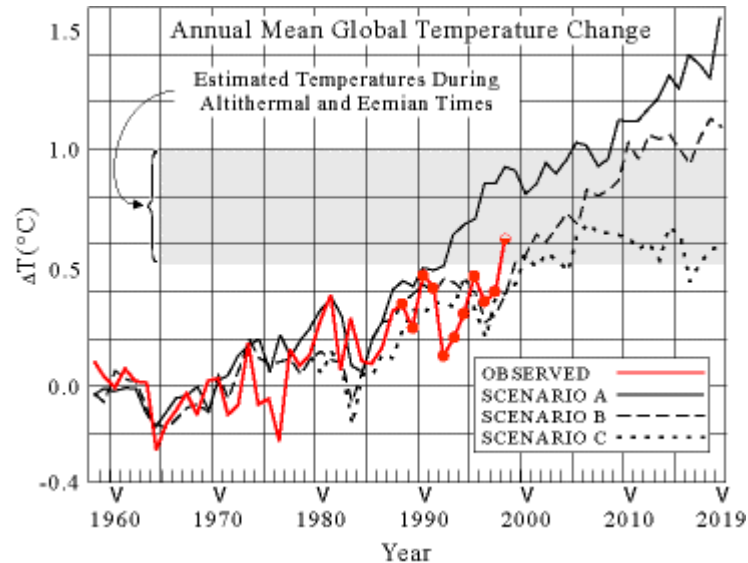
Global Warming



- World Produces about 6×10^6 metric tons / year
- Expected to rise to about 10×10^6 metric tons / year in 2020 due to increased usage in developing countries.

Many influential scientists have described the relationship between this gas production and global climate change. The public is in various stages of agreement with these claims. Political momentum seems to be stalled for policy makers who wish to restrict the production of greenhouse gas.

Hansen.



Kyoto

"From December 1 through 11, 1997, more than 160 nations met in Kyoto, Japan, to negotiate binding limitations on greenhouse gases for the developed nations, pursuant to the objectives of the Framework Convention on Climate Change of 1992. The outcome of the meeting was the Kyoto Protocol, in which the developed nations agreed to limit their greenhouse gas emissions, relative to the levels emitted in 1990. The United States agreed to reduce emissions from 1990 levels by 7 percent during the period 2008 to 2012."

DOE Website

55 Nations, representing at least 55% of the world's greenhouse gas emissions must sign.

Let's discuss. In the U.S. constitutional system, treaties signed by the President and ratified by Congress take on the force of law.

1. The Clinton Admin. signed Kyoto.
2. Bush Admin in 2001 withdrew U.S. from Kyoto process.