Immigration and Energy

Some Inconvenient Truths

BY DONALD F. ANTHROP

Environmentalists would like Americans to believe that SUVs and pickup trucks are responsible for America's growing oil consumption and that the increase in greenhouse gas emissions could be halted if only the U.S. switched from fossil fuels to "renewable" energy sources and Congress raised the fuel economy standards for motor vehicles.

The reality is rather different. In the first place, both energy consumption and gasoline consumption in the U.S. are being driven almost entirely by population growth. U.S. per capita energy consumption in 2005 was 337 million BTU (British thermal units)—little changed from the 347 million BTU in 1974, the year of the Arab oil embargo.[1,2] The 35 percent increase in energy consumption during this time period was due almost entirely to the 83 million people added to the U.S. population. Per capita gasoline consumption in 2005 was 11.2 barrels—the same as in 1974.[3] Although the average fuel economy of passengers on the road increased from 13.6 miles per gallon [mpg] to 22.4 mpg, this improvement in fuel economy was offset by increases in the number of vehicles and the mileage each vehicle was driven.[4] The 39 percent increase in gasoline consumption between 1974 and 2005 essentially matches the 39 percent increase in population.

As population increases drive up energy consumption, motorists will feel the pinch at the pumps as consumer demand is likely to exceed patroleum inventories.

Environmentalists and many members of Congress who should know better talk glowingly of reducing the nation's oil consumption by converting the gasoline supply to E85—a mixture consisting of 85 percent gasoline and 15 percent ethanol. If this ethanol were produced from corn, about 82 percent of the existing U.S. corn crop would be consumed for ethanol production.[5,6] It is worth noting that approximately 14 percent of the U.S. corn crop is irrigated, and this irrigated acreage consumes almost 18 million acre-feet [MAF of water—most of which is overdrafted from the Ogallala aquifer in the Great Plains.[7,8] To put this water requirement into some perspective, the average annual flow of the Colorado River at Lee's Ferry is only about 14 MAF. Furthermore, much of this corn acreage in the Great Plains states is easily erodable land, and numerous studies have conclusively demonstrated that row crops—such as corn—result in much higher erosion rates than cereal grains or forage crops.[9] In one study done near Zanesville, Ohio, a continuous corn roping sequence produced a soil loss nine times that for wheat grown in a rotation sequence with corn.[10]

The Congressional Budget Office, in its recent report on the Senate immigration reform bill, S.2611, has estimated the Senate bill would give permanent residence to 24.4 million immigrants

Donald Anthrop *is professor emeritus of environmental studies at San Jose State University and the author of more than 60 papers and articles on energy and water resources.*

over the next 20 years.[11] Population growth in the U.S. is being driven by immigration. The birth rate among immigrants is higher than for the native-born population. Because the average age of immigrants is lower than that of the native-born population, the death rate is lower. Consequently, the natural rate of increase for the U.S. population is about 0.565 percent per year compared to zero for most European countries.[12] If we assume the net rate of increase remains constant, the immigration allowed under the Senate bill will result in a population increase of approximately 62 million by 2026.[13]

If per capita gasoline consumption remains constant, this population growth will increase gasoline consumption by 695 million barrels/year or 21 percent—dwarfing the savings that would be realized by switching to E85. Indeed if corn ethanol were to supply *just the additional gasoline requirement for the 62 million people,* corn acreage would have to be increased by 117 million acres—which equals about 25 percent of all the cropland in the U.S.[14] Growing a crop that results in soil erosion nine-fold greater than wheat or with overdrafted groundwater just to support the immigration of more people into the U.S. hardly qualifies as a sustainable policy.

Recently a number of articles have appeared in the popular press touting the supposed benefits of biodiesel fuel as a substitute for conventional diesel. However, none of these have addressed the question of potential production of biodiesel or compared such production to the demand created by population growth. Biodiesel fuel is produced from fats and oils, but these fats and oils are also consumed in food, animal feed, and chemical production. The only oils that currently can be considered surplus and available for biodiesel production are those that are exported. These exported oils [primarily oilseed oils, such as soybean] could produce about 40 million barrels of biodiesel per year or about 0.5 percent of U.S. petroleum consumption.[15]

In order to increase the supply of oils for biodiesel production, the acreage of oilseeds [mostly soybeans or canola] would have to be expanded. The top 5 soybean producing states [Iowa, Illinois, Minnesota, Indiana, and Nebraska] are also the top 5 corn producing states. Consequently, soybean acreage is in competition with corn acreage for ethanol production, and indeed, soybean acreage in the top 7 producing states declined between 2001 and 2005.[16] Since soybeans require a warm, humid climate, they are not grown in the arid west, even with irrigation. Consequently, the potential for expansion of soybean acreage is limited.

It has been suggested that some land in the CRP [Conservation Reserve Program] might be planted to canola when the CRP contracts expire. There are currently 34.8 million acres under CRP contracts of which 11.1 million acres, or almost one-third of the total acreage, are in the four states consisting of North Dakota, South Dakota, Montana, and Kansas.[17] If all 11 million acres were planted in canola, 19 million barrels/year of biodiesel could be produced.[18]

The Senate immigration bill would give permanent residence to approximately 24.4 million immigrants. Since U.S. per capita oil consumption in 2005 was 25.4 barrels/year, these immigrants

would increase U.S. petroleum consumption by 620 million barrels/year or 32 times the amount of biodiesel obtainable from the 11 million acres of CRP land.[19]

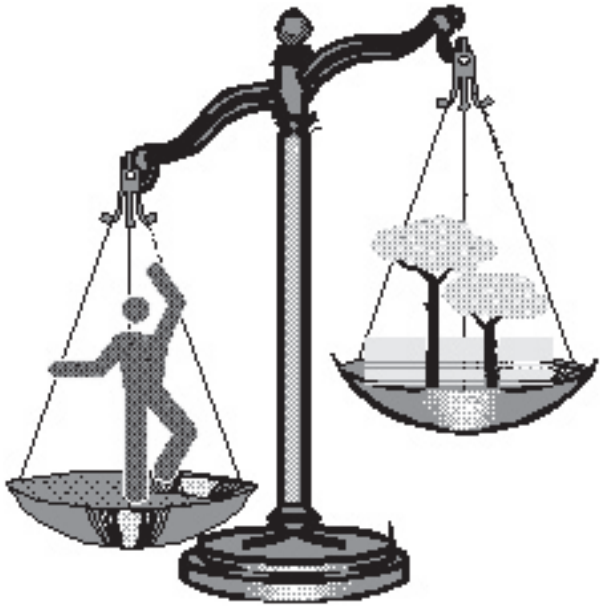
Furthermore, if the present energy mix remains the same, these 62 million people will produce a 21 percent increase in carbon dioxide emissions.[20] And, the energy mix is unlikely to change much. As the gasoline data show, renewable energy sources simply cannot provide either the liquid fuels or the total energy required by the U.S. economy. Indeed, even if it were possible to collect all of the above-ground residue from the 200 million acres of corn, soybeans, wheat, rice, and oats in the U.S., the energy content of that residue represents only 35 percent of the energy needed by these 62 million people.[21] Clearly, the impact of immigration will overwhelm all efforts to produce fuels from biomass.

The European Union [EU], which has been one of the leading advocates of the Kyoto Protocol, is finding that even with a stable population, carbon dioxide emissions in 2004 were 4 percent above 1990 levels, and the EU's goal of reducing the collective emissions of its members by 8 percent below 1990 levels by 2012 is rapidly becoming more elusive.[22]

Many of the same members of the U.S. Senate who complain about global warming and America's "addiction" to oil are also staunch supporters of S.2611 and amnesty for millions of illegal immigrants—which suggests they are more interested by buying votes by pandering to immigrant communities than in the long-term interests of the United States. ■

End Notes

1. Energy data in the U.S. are usually given in BTU. A BTU (British Thermal Unit) is defined as the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit.
2. Energy consumption data for 1974 taken from Table 1.3, Monthly Energy Review, May, 2005, DOE/EIA-0035(1005/05). Energy consumption data for all other years taken from Table 1.3, Monthly Energy Review, July 2006, DOE/EIA-0035(2005/07). Population data for years 1973—1990 taken from Table 2, Population 1960—2002, *U. S. Statistical Abstract, 2003,* U.S. Census Bureau. Population data for years 2001—2005 taken from Table 1, Annual Estimates of the Population of the U.S. and Puerto Rico: April 1, 2000—July 1, 2005 [NST-EST 2005-01], December 22, 2005.
3. Table 3.4, Finished Motor Gasoline Supply, Disposition, and Stocks, Monthly Energy Review, July 2006, DOE/EIA-0035(2006/07).
4. Table 1.9, Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates, Monthly Energy Review, July 2006, DOE/EIA-0035(2006/07).



5. During the 4-year period 2002—2005, the average annual harvested acreage of corn in the U.S. was 72.253 million acres and annual production averaged 10.494 billion bushels. Data obtained from: U.S. and All States Data for Crops—Planted, Harvested, Yield,

Production, Price and Value of Production, USDA—NASS—Quick Stats—Crops, National Agricultural Statistics Service, U.S. Department of Agriculture, 2006.
6. Ethanol yield from corn is approximately 2.5 gal/bu.
7. Irrigated acreage for corn from County Data for Crops—Corn, USDA—NASS—Quick Stats—Crops, National Agricultural Statistics Service, U.S. Department of Agriculture, 2006.
8. Consumptive irrigation water requirement for corn taken as 24.2 inches/yr from Facts and Figures, Westlands Water District, Fresno, CA, 1989. Since Westlands Water District is one of the most efficient irrigation districts in the country, actual water use by U.S. farmers growing irrigated corn will be greater.
9.D. F. Anthrop, Ethanol and Environment, *Oil and Gas Jour. 102.3,* p. 10, January 19, 3004.
10. J. P. Zublena, Corn Cropping Sequences, NCH—50, *National Corn Handbook,* Purdue University Cooperative Extension Service, West Lafayette, IN, 1987.
11. S. 2611, Comprehensive Immigration Reform Act of 2006, Congressional Budget Office Cost Estimate, U.S. Congressional Budget Office, Washington, D.C., August 18, 2006.
12. Average natural rate of increase of 0.565 percent/yr for the period 1999—2004 computed from vital statistics data from the following: a) U.S. Birth Rate Reaches Record Low, National Center for Health Statistics, Released June 25, 2003. b) Births, Marriages, Divorces, Deaths: Provisional Data for 2003, *National Vital Statistics Reports 52,* No. 22, June 10, 2004, CDC. c) Table 83, Live Births, Deaths, Marriages, Divorces 1950—2001, *U.S. Statistical Abstracts, 2003,* Census Bureau. d) Births: Final Data for 2003, *National Vital Statistics Reports 54,* No. 2, 2006. e) Deaths: Final Data for 2003, *National Vital Statistics Reports 54,* No. 13, April 19, 2006. f) Deaths: Preliminary Data for 2004, *National Vital Statistics Reports, 54,* No. 19, June 28, 2006. g) Births: Preliminary Data for 2004, *National Vital Statistics Reports 54,* No. 8, Dec 29, 2005. h) World Population Data Sheet, Population Reference Bureau, Washington, D.C. 2006.
13. Calculated from the immigration data in Table 2 of reference 11 and a natural rate of increase of 0.565 percent per year.
14. Table 9-13, Land Utilization for Selected Years 1940—1997, *Agricultural Statistics 2003,U.S.* Department of Agriculture, Washington, D.C., 2003.
15. K. S. Tyson, J. Bozell. R. Wallace, E. Petersen, L. Moens, *Biomass Oil Analysis: Research Needs and Recommendations*, NREL/TP-510-34796, National Renewable Energy Laboratory, Golden CO, June 2004.
16. State Data—Soybeans—Planted, Harvested, Yield, Production, Price, Value of Production, NASS—Quick Stats—Crops, National Agricultural Statistics Service, U.S. Department of Agriculture, 2006.
17. Table 12-13, Conservation Reserve Program: Enrollment by State, January 2005, *Agricultural Statistics 2005,* U.S. Department of Agriculture, Washington, D.C.
18. In Calculating this we used a yield of 1,405 lbs/ac for canola [the average for the period 2001—2005] obtained from reference 16 and 0.0513 gal biodiesel/lb canola from reference 15.
19. Table 3.1b, Petroleum Overview: Disposition and Stocks, *Monthly Energy Review*, July 2006, DOE/EIA-0035(2006/07).
20. D. F. Anthrop, The U.S., Carbon Emissions, and the Kyoto Protocol, *Pacifica,* Spring 2006, The Association of Pacific Coast Geographers, Sacramento, CA, 2006.
21. See table below after note 22 to assess the following data for this calculation.
22. R. Tippee, The Kyoto Approach, *Oil and Gas Jour 104.27,* p. 17, July 17, 2006.

Crop	Average acreage 2002 -2005 (million ac)	Residue (lbs/ac)	Heat Value (BTU/lb)
Corn	72.253	7,300	7,500
Soybeans	72.57	3,600	7,500
Rice straw	3.22	4,000	7,000
Wheat & Oat straw	51.72	3,600	7,500