

California's AB 1493

Carbon dioxide emissions and mass immigration

by Don Anthrop

In an election year move designed to garner support from liberals and environmentalists, on July 23, 2002, California's Gray Davis signed AB 1493, a bill that requires California's Air Resources Board (CARB) to adopt regulations to reduce carbon dioxide emissions from motor vehicles. (See Note A at end of text.) The legislation itself does not specify the required magnitude of the reductions or the methods by which any reductions are to be achieved. These are left to the Air Resources Board, a body of appointed bureaucrats, to determine. The required regulations must be adopted by January 1, 2005 and will apply to vehicles manufactured in the 2009 model year and thereafter. The regulations to be adopted by CARB may not ban the sale of any particular vehicle type, set weight restrictions, reduce speed limits, limit vehicle miles traveled, or impose taxes on vehicles, fuel, or vehicle miles traveled.¹

If the environmentalists who were so ecstatic when Governor Davis signed this legislation were really interested in reducing carbon dioxide emissions they would be pressing for curbs on immigration into the United States. But curbing immigration is not deemed to be politically correct in liberal green circles, so the environmentalists attempt to legislate how people should live.

The real objects of the environmentalists' ire are sport utility vehicles (SUVs) and pick-up trucks. The

automobile industry is correct in asserting that the new law is a back-door attempt to impose fuel efficiency standards on vehicles sold in California.² There are basically only two ways to reduce carbon dioxide emissions from motor vehicles: 1) Increase the fuel efficiency, and/or 2) Reduce the total vehicle miles traveled. The new law specifically prohibits CARB from adopting the latter strategy, which is impossible to achieve anyway with a growing population. Some small improvements in fuel efficiency could be achieved (at considerable cost) through the use of multi-valve engines, tire designs that reduce rolling resistance, variable transmissions, etc. The main strategy that auto makers used to improve fuel efficiency of passenger cars, namely weight reduction, cannot be successfully employed on trucks at reasonable cost. Trucks are designed to carry loads — often heavy loads — up steep hills on rough terrain. Yes, some people use trucks to go to the mall, but there is a legitimate need for four-wheel drive trucks in the U.S. Are we prepared to tell farmers the future trucks they buy will not be able to haul a couple of tons of fertilizer out into a field?

Despite claims by environmentalists to the contrary, even if California's new law survives court challenges and legislative review, and some type of fuel economy standards are ultimately implemented, the effect on world carbon dioxide emissions will be miniscule. On December 31, 2000, there were 8.9 million light trucks, SUVs, and vans registered in California.³ The Department of Energy estimates the average fuel economy of the existing fleet of light trucks, SUVs, and vans in the U.S. in the year 2000 was 17.5 miles per gallon (mpg).⁴ The current federal fuel economy (CAFÉ) standard for new passenger cars sold in the U.S. is 27.5 mpg. If we assume that the average fuel economy of the 8.9 million light trucks, SUVs, and vans registered in California matches the U.S. average of 17.5 mpg, then if this entire

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fleet of 8.9 million vehicles were *instantly* replaced with new passenger cars with an average fuel economy of 27.5 mpg, the annual reduction in carbon dioxide emissions would total about 5.1 million metric tons [m.t.] of carbon. [One m.t. = 1,000 kilograms = 2,205 pounds.] To put this into some perspective, between now and 2009, when the regulations adopted under this new legislation are supposed to be implemented, China's carbon dioxide emissions are expected to rise from 768 to 1,073 million m.t. of carbon per year — an increase of 305 million m.t. of carbon per year.⁵

The growth of energy consumption in the U.S. is being driven by population growth, not by SUV's and pick-up trucks. Table 1 presents a summary of the resident population, energy consumption, and per capita energy consumption for years 1973, 1974, and 2000. In October 1973, the Arab members of OPEC initiated an embargo on oil shipments to the U.S. Because of the transit time of tankers from the Persian Gulf to the U.S., the effects of the embargo were not really felt in the U.S. until 1974. Thus, 1973 is generally viewed as pre-embargo. Of much more lasting significance than the embargo itself was the era of higher oil prices ushered in by the embargo.

As the last column in Table 1 shows, per capita energy consumption in the year 2000 was virtually the same as in 1974. Thus, the 25-quad increase (about 30 percent) in energy consumption during this period was due almost entirely to the 68.6 million people added to the U.S. population — a 32 percent increase. [Thermal energy is measured in British Thermal Units (BTUs). A BTU is the amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit. U.S. energy consumption is usually expressed in quadrillion (10^{15}) BTU. One quadrillion BTU is called a quad.]

Table 2 shows legal immigration into the U.S. for fiscal years 1974 to 2000. As the table shows, in fiscal year (FY) 2000 there were 849,807 legal immigrants admitted into the U.S. By how much did these 849,807 immigrants increase U.S. carbon dioxide emissions? The data in Table 1 show that U.S. per capita energy consumption in 2000 averaged 351 million BTU. Multiplying these two numbers together we find that

Table 1
United States resident population, energy consumption, per capita energy consumption

<u>Year</u>	<u>Resident Population</u> <u>April 1</u>	<u>Energy Consumption</u> <u>(Quadrillion BTU)</u>	<u>Per Capita Consumption</u> <u>(million BTU)</u>
1973	210,839,000	75.808	360
1974	212,846,000	74.080	348
2000	281,422,000	98.775	351

Sources:

Population data from U.S. Statistical Abstracts, 2001 and Census 2000 PHV-T-2, Ranking Tables for States, 1990 and 2000, Census Bureau (April 2, 2001).

Energy data from Monthly Energy Review, Table 1.4, DOE/EIA-0035 (2002/07), U.S. Department of Energy, Washington, DC, (July 29, 2002).

0.298 quads of the 2.008 quad increase in energy consumption in the year 2000 is directly attributable to immigration. This comes to 15 percent of the total increase. (See Note B at end of text.) Table 3 presents a summary of U.S. energy consumption and carbon dioxide emissions (expressed in metric tons of carbon) for years 1990, 1998, and 1999. From these data we have calculated a quantity we shall call carbon intensity, namely carbon emissions per quad of energy consumed. Values for carbon intensity are tabulated in the fourth column of Table 3. These values show a slight decline from 1990 to 1999, which may be due to increased use of natural gas, an increase in electrical energy generation from nuclear power reactors, and a small increase in other non-fossil energy use. However, the reader should bear in mind the fact that these numbers are subject to some uncertainty. For example, the carbon content of coal varies with location. Although coal production data are tabulated by state, there is considerable variation of carbon content within a single state. Some natural gas contains carbon dioxide at the well-head, but these quantities are not normally recorded. This carbon dioxide is, of course, subsequently released into the atmosphere.

If we now assume a carbon intensity of 15.6 million m.t. of carbon per quad of energy for the year 2000 and apply this to the 0.298 quads of energy directly attributable to year 2000 immigration, we find that 4.6 million m.t. of carbon emissions are directly attributable to year 2000 immigration alone. Thus, the increased carbon dioxide emissions that result from the legal immigrants admitted to the U.S. in a single year (2000)

would offset 90 percent of the reduction that would be achieved if all of the SUVs, vans, and light trucks registered in California were instantly replaced with passenger cars with an average fuel economy of 27.5 mpg.

As we noted earlier, regulations adopted by CARB under AB 1493 are supposed to apply to model year 2009 vehicles. Since some 2009 model year vehicles can be expected to arrive at dealers in the summer of 2008, let us pose the question, "By how much will U.S. carbon emissions increase between July 1, 2002 and July 1, 2008 because of immigration?" To answer this question, we must first estimate immigration between 2002 and 2008.

As noted in the footnotes to Table 2, at the end of FY 2000 there was a backlog of one million immigration status adjustments pending.⁶ Historically, 7 percent have been denied.⁷ Therefore, we assume 930,000 will be approved. For the purposes of estimating future legal immigration, we have assumed that 93,000 of these status adjustment cases will be admitted each year from 2001 to 2010. We assume that the number of immigrants subject to numerical limitation remains at 675,000 each year. Finally, the average number of asylees and refugees admitted annually during the eight-year period 1990 through 1997 was 119,700. These are in addition to immigrants subject to a numerical cap. (We have excluded data for years 1998-2000 from this calculation because the reduced number of asylees and refugees admitted during those years was the result of the mounting backlog of status adjustment cases.) We therefore estimate that total legal immigration will average 887,700 during the period 2002-2008. Total legal immigration between July 1, 2002 and July 1, 2008 is therefore estimated to be 5.326 million. If we assume U.S. per capita energy consumption remains constant at 351 million BTU, these 5.3 million immigrants will result in an increase in U.S. energy consumption of 1.87 quads per year and an increase in carbon dioxide emissions of 29.2 million m.t. of carbon per year. Thus, before any regulations can even be implemented under AB 1493, immigration will have increased U.S. carbon dioxide emissions by 29.2 million m.t. of carbon per year. (It should also be noted that the descendants of immigrants, though they are counted as natural population increase, further add to the carbon emissions. And, of course, illegal immigration should also be mentioned, even if the numbers of illegal immigrants are inaccurately known.

Table 2
Legal immigration into the United States
Fiscal years 1974 - 2000

<u>Fiscal</u> <u>Year</u>	<u>IRCA</u> <u>Legalization</u> [*]	<u>Non-IRCA</u> <u>Legalization</u>	<u>Total</u>
1974		394,861	394,861
1975		386,194	386,194
1976		398,613	398,613
1977		462,315	462,315
1978		601,442	601,442
1979		460,348	460,348
1980		530,639	530,639
1981		596,600	596,600
1982		594,131	594,131
1983		559,763	559,763
1984		543,903	543,903
1985		570,009	570,009
1986		601,708	601,708
1987		601,516	601,516
1988		643,025	643,025
1989	478,814	612,110	1,090,924
1990	880,372	656,111	1,536,483
1991	1,123,162	704,005	1,827,167
1992	163,342	810,635	973,977
1993	24,278	880,014	904,292
1994	6,022	798,394	804,416
1995	4,267	716,194	720,461
1996	4,635	911,265	915,900
1997	2,548	795,830	798,378
1998	955	653,496	654,451
1999		646,568	646,568
2000		849,807	849,807

^{*}Illegal immigrants who were granted legal permanent residence under the amnesty program of the Immigration Reform and Control Act of 1986.

Note: The INS has reported that between the end of fiscal years 1994 and 1998, the backlog of applications for adjustment of status increased 690,000 from 121,000 to 811,000. The backlog increased by an additional 189,000 to one million at the end of FY 2000.

Sources: United States Statistical Abstracts, 1977, 1980, 1983, 1985, 1987, 1991, 1997, 2000; Legal Immigration, Fiscal Year 2000, Annual Report, Statistics Division, Office of Policy and Planning, Immigration and Naturalization Service, U.S. Department of Justice, (January 2002).

See Note D at the end of text.)

One final observation should be noted. During fiscal years 1995 through 2000 there were 4,585,565 legal immigrants admitted to the U.S. of which 1,120,422 or 24.43 percent declared California their state of intended residence.^{6,7} (Years prior to 1995 were not included in

this calculation because the large number of immigrants admitted under the amnesty provisions of the 1986 Immigration Reform and Control Act may distort the data.) If we assume that 24.43 percent of the estimated 5.326 million immigrants that will be admitted to the U.S. between July 1, 2002 and July 1, 2008 go to California, then California will receive 1.301 million immigrants during this period. Applying the average per capita energy consumption of 351 million BTU to these immigrants and using the same carbon intensity of 15.6 million m.t. of carbon per quad, we find these 1.301 million immigrants will increase California's carbon dioxide emissions by 7.12 million m.t. of carbon per year. Thus, by July 1, 2008, when any regulations adopted under AB 1493 to limit carbon dioxide emissions from motor vehicles first become effective, carbon dioxide emissions just in California will have increased by 7.12 million m.t. of carbon per year solely as a result of immigration.

Clearly, investments to reduce carbon dioxide emissions from motor vehicles are a waste of money as long as the reductions achieved from these investments continue to be overwhelmed by the effects of immigration.

NOTES

A. In the text I use the term "carbon dioxide emissions" because the gas actually being produced as a result of the carbon combustion is carbon dioxide. However, I expressed all of the numbers in terms of metric tons of carbon, which has become the standard way of expressing carbon emissions. The data in Table 3 are also expressed in metric tons of carbon.

B. Energy consumption in the year 2000 is given in Table 1 as 98.775 quads. Energy consumption in 1999 is given in Table 3 as 96.767 quads. The increase from 1999 to 2000 is 2.008 quads. Thus, the 0.298 quads directly attributable to immigration constitute about 15% of this increase.

C. Moving energy-intensive industry offshore does not necessarily change carbon intensity. It would do so only if more coal-burning industry than gas-burning industry moved offshore. We don't have data that show such is the case. Our use of electrical energy further complicates any attempt to calculate this because the sources of electrical energy vary considerably in different regions of the country.

D. During the 9-year period 1990-98, the average annual

Table 3
United States carbon dioxide emissions, energy consumption, and carbon intensity, 1990, 1998, and 1999

<u>Year</u>	<u>CO² Emissions⁽¹⁾</u> <u>(million metric tons</u> <u>of carbon)</u>	<u>Energy</u> <u>Consumption⁽²⁾</u> <u>(Quadrillion BTU)</u>	<u>Carbon Intensity</u> <u>(million metric tons</u> <u>carbon/quad)</u>
1990	1,352	84.344	16.03
1998	1,495	94.623	15.80
1999	1,517	96.767	15.68

(1) From table A 10, World Carbon Dioxide Emissions by Region 1990-2020, International Energy Outlook 2002, DOE/EIA-0484, U.S. Department of Energy, Washington, DC (March 26, 2002)

(2) From Table 1.4, Energy Consumption by Source, Monthly Energy Review, July 2002, DOE/EIA-0035 (2002/07), U.S. Department of Energy, Washington, DC (July 29, 2002).

natural rate of increase [birth rate minus death rate] in the U.S. was 0.665 percent, while the rate in Europe is essentially 0. Were it not for immigrants, the vast majority of whom today come from less developed countries with high birth rates, we would expect the natural rate of increase in the U.S. to more closely approximate Europe's. The Census Bureau has estimated a total fertility rate of 2.049 for women of all races and 2.921 for women of Hispanic origin.

FOOTNOTES

1. Assembly Bill No. 1493, p. 8, as passed by the Assembly July 1, 2002, and passed by the Senate June 29, 2002, Office of the Legislature, State of California (2002).

2. "Carmakers Scoff at State Standards," *West County Times*, Walnut Creek, California (July 24, 2002.)

3. State Motor Vehicle Registrations, 2000, Table MV-1, and Truck and Truck/Tractor Registrations — 2000, Table MV-9, Bureau of Transportation Statistics, U.S. Department of Transportation (2002).

4. Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates for Year 2000, Table 1.10, Monthly Energy Review, July 2002, DOE/EIA-0035(2002/07), U.S. Department of Energy, Washington, DC.

5. Carbon emissions for China for years 2002 and 2009 estimated from data for 1999, 2005, and 2010 given in World Carbon Dioxide Emissions by Region, 1990-2020, Table A.10, International Energy Outlook 2002, DOE/EIA-0484, U.S. Department of Energy, Washington, DC (March 26, 2002).

6. Legal Immigration, Fiscal year 2000, Annual Report, Statistics Branch, Office of Policy and Planning, Immigration and Naturalization Service, Department of Justice, Washington, DC (January 2002).

7. Legal Immigration, Fiscal year 1998, Annual Report, Statistics Branch, Office of Policy and Planning, Immigration

and Naturalization Service, Department of Justice,
Washington, DC (July 1999).