
BRINGING THE WORLD TO THE U.S. STANDARD OF LIVING

KEY QUESTIONS

- What would be the environmental impact of bringing world oil consumption to U.S. levels?
- What is the relationship between U.S. oil consumption and our standard of living?
- Would bringing the world to the U.S. standard of living be compatible with principles of sustainability?

Development agencies such as the World Bank¹ have a stated goal of enabling “developing” nations to reach a standard of living comparable to western countries such as the United States. In this Issue, we will investigate what that might involve and what kind of impact it would have on the world’s oil supply and demand.

STANDARD OF LIVING ESTIMATES

For purposes of comparison, we can estimate a country’s standard of living by dividing the total annual value (in dollars) of goods and services (the gross domestic product, or GDP) by a country’s population to derive the per capita GDP. To do this calculation for the United States, divide the approximate 2011 GDP (\$15,300 billion)² by the 2011 population (approximately 311 million).³

Question 9-1: What was the U.S. per capita GDP for 2011?

Global economic product (GEP), or global GDP, the combined value of goods and services of all the world’s nations, is harder to measure, but it approximated \$65 trillion in 2011,⁴ according to the International Monetary Fund (IMF).

¹ See www.worldbank.org.

² Bureau of Economic Analysis, <http://www.bea.gov>.

³ U.S. Census Bureau, www.census.gov.

⁴ *The Economist*, May 2012.

Question 9-2: Given a global population of approximately 7.05 billion in 2011, calculate the global per capita GDP for 2011.

Question 9-3: By what factor (2×, 4×, etc.) would the per capita GDP have to be increased to U.S. per capita GDP to equal the U.S. GDP in 2011?

USING OIL CONSUMPTION TO ESTIMATE LIVING STANDARDS

The U.S. economy is heavily dependent on oil (see Issue 7). Oil provides more than 37% of the total U.S. energy supply and virtually all of its transportation fuel. According to the Energy Information Administration (EIA) the transportation sector consumes about 28 percent of all domestic energy.⁵ For 2011, global oil production was about 87.5 million barrels per day, according to the U.S. CIA, and the United States consumed about 19 million barrels per day.

Question 9-4: What percentage of world oil production for 2011 was consumed by the United States?

To produce and consume the goods and services that Americans think of when we imagine a high standard of living requires oil, and a lot of it. Oil, for example, is essential to American agriculture. According to Pimentel and others, “the intensive farming technologies of developed countries use massive amounts of fossil energy for fertilizers, pesticides, and irrigation, and for machines as a substitute for human labor.”⁶ And most of this fossil energy comes from oil. So even if we cannot directly correlate oil consumption with standard of living, our way of life, which we are exporting to the rest of the world, is critically dependent on oil.

However, standard of living is much more than some threshold level of median income or level of material consumption. Many thoughtful observers prefer to use *quality of life* as a more reasonable measure of living standard. Measuring quality of life consists at least partially of evaluating intangibles such as the following:

- Clean drinking water and unpolluted air
- Access to quiet and solitude, especially in densely populated cities
- Alternatives to automobiles and clogged roads in making transportation decisions

⁵ U.S. Energy Information Administration, <http://www.eia.doe.gov/>.

⁶ Pimentel, D., X. Huang, A. Cordova, & M. Pimentel. 1997. Impact of population growth on food supplies and environment. *Population and Environment*, 19: 11.

- Access to quality medical care at reasonable prices
- A job that pays a “living wage”
- A safe, low-crime environment
- A relatively secure old age

Nevertheless, we can get some appreciation of what would be required to allow the world’s population to enjoy a U.S. lifestyle by analyzing petroleum consumption. Therefore, we will assume that a reasonable measure of our standard of living, aspired to by much of the developing world, is our per capita oil consumption.

Question 9-5: Do you think this assumption is reasonable? If not, suggest alternatives and defend your conclusion with reasoning.

Question 9-6: Let’s analyze the consequences of bringing the world’s per capita oil consumption to U.S. levels. Using the data on U.S. oil consumption given above and a 2011 population of 311 million, calculate the U.S. per capita oil consumption in 2011 in barrels per person per year. Convert that figure to gallons (1 barrel = 42 gallons).

Question 9-7: To calculate world oil consumption at U.S. levels, simply multiply the U.S. per capita consumption figure by the mid-2011 world population (7.0 billion).

Question 9-8: World total petroleum production in 2011 was approximately 32 billion barrels. For the world to consume oil at the rate of the United States, world production would have to increase by what factor (2×, 3×, etc.) over 2011 levels?

Question 9-9: Next, let's assume that the U.S. consumption were to drop by one third, to roughly that of the European Union (EU). In this new scenario, world oil production would have to increase by what factor (50%, 2×, 3×, etc.) to bring the world to the per capita consumption levels of the EU?

Question 9-10: Given a 2011 world population growth rate of 1.2 percent per year, how long would it take the world's population to double? By what year would this doubling occur? (See "Using Math in Environmental Issues," pages 6–8 for a review of doubling time.)

Question 9-11: Proven petroleum reserves are roughly 1,380 billion barrels (see Issue 7). Compare the annual oil demand of a world population consuming at U.S. levels (the answer from Question 9-7) to proven oil reserves of 1,380 billion barrels.

Question 9-12: Can sustainable societies be built on oil consumption at U.S. levels? Why or why not?

Question 9-13: Summarize the main points of this Issue.