

Selected Issues in THE USGS ENERGY RESOURCE SURVEYS PROGRAM

The USGS World Energy Program

"The need for understanding the availability of world energy resources has never been greater. The interplay of increasing domestic reliance on oil imports, world population growth with attendant increased energy demands, regional political instabilities, and global environmental concerns requires that the United States has access to the best possible energy information. The U.S. Geological Survey uniquely provides and develops this information in an objective, non-advocacy manner, based on extensive experience in preparing National Assessments of Oil and Gas Resources and regular assessments of the world petroleum outlook".

—Dr. Thomas Ahlbrandt
U.S. Geological Survey

The world has recently experienced rapid change to market-driven economies and increasing reliance on petroleum supplies from areas of political instability.

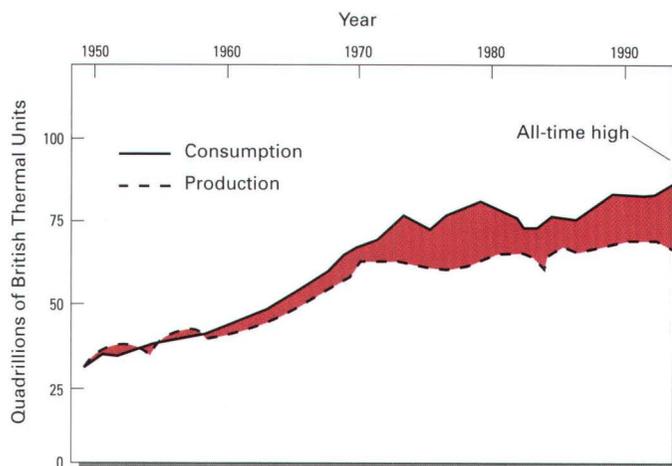
The interplay of unprecedented growth of the global population, increasing worldwide energy demand, and political instability in two major petroleum exporting regions (the former Soviet Union and the Middle East) requires that the United States maintains a current, reliable, objective assessment of the world's energy resources. The need is compounded by the environmental implications of rapid increases in coal use in the Far East and international pressure on consumption of fossil fuels.

The United States and the world are increasingly dependent on oil from concentrated supply sources.

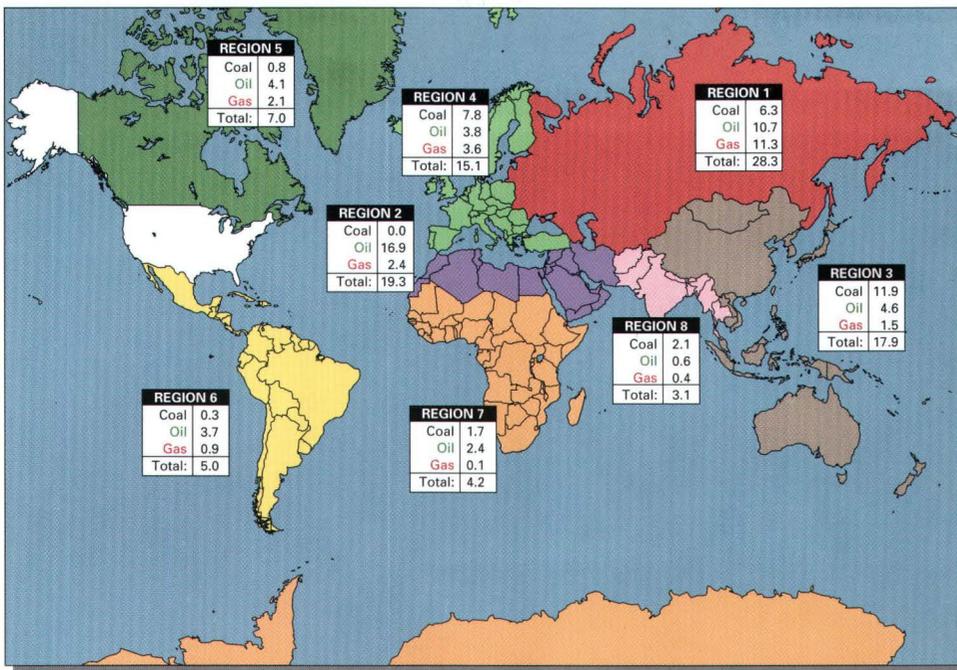
The nearly complete interdependence of world and domestic energy resources underscores the significance of record-setting fossil energy consumption in the United States coupled with continuously declining production of domestic oil and gas. New studies on the actual availability of coal suggest that the historically large coal resources in the United States may be considerably less than previously thought. The efficient world oil market and the close linkage of natural gas and oil prices means that supply disruptions and price fluctuations anywhere in the world market will directly and rapidly affect the domestic energy markets. National economic security requires that we understand foreign energy sources available to the world market.

The U.S. Geological Survey (USGS) is uniquely qualified to assess world energy resources.

USGS scientists regularly conduct world and national assessments of oil, gas, and coal resources, based on the best available data and methodologies. Recent assessments have incorporated rigorous statistical and mathematical techniques, coupled with in-depth geologic knowledge, to yield new insights to the nature and distribution of domestic energy resources. New world energy assessments will rely on data-intensive analyses and increasingly rigorous mathematical techniques developed and tested in assessments of the domestic oil, gas, and coal resources. World energy assessments are scientifically based, objective, and thoroughly documented.



Graph comparing U.S. domestic energy consumption and production. The area between the curves reflects the growth of imports, particularly petroleum, to meet increasing energy needs which have reached an all-time high according to Energy Information Agency (EIA) data.



TOTAL ENERGY PRODUCTION	
Coal	31.0
Oil	47.0
Gas	22.0

Map showing percent of world production of oil, natural gas, and coal for each of the eight World Energy regions. Data from EIA, 1994.

A variety of models for energy resource assessment will be applied to world studies.

The United States is endowed with an enormous number of fossil energy accumulations of almost every size and geologic type. Few regions of the world have been explored and studied to the degree the United States has. Thus, models developed for domestic resource evaluation provide a rich range of analogues that can be successfully transferred to other areas of the world.

USGS researchers have established criteria for world energy resources.

USGS workers have divided the world into eight regions similar to the economic regions used by the U.S. State Department. All areas of the world, all commodities cannot be treated simultaneously. Priorities for assessment of energy resources are established based on criteria such as level of abundance of energy in a region as reflected by historical production; current level of knowledge about the area, with more emphasis on poorly known areas; and, regions where the United States has special and particular interests. The important factors are not just the volume of production but rather issues such as potential for future development, documentation of existing resources, relevance of the resources in U.S. trade, or country specific needs. Considering these factors and objectives, the current ranking production by regions are as follows: 1. the former Soviet Union, 2. Middle East and North Africa, 3. East Asia and Pacific, 4. Europe, 5. North America exclusive of the U.S., 6. Latin America, 7. Sub-Saharan Africa and Antarctica, and 8. South Asia.

The World Energy Program will develop results in entirely digital media.

The results, data, methods, and interim products of the world energy studies of oil, gas, and coal will be developed in a Geographic Information System. Such information as regional geology, historical oil and gas information, stratigraphic information, and estimates of future energy sources will be included and published on CD-ROM, Internet, and other media. Thus, for the first time, World Energy Program resources will be fully digitally documented and reported (OFR 97-463, OFR 97-470 A, 97-470 B, and 97-470 C).

<http://energy.cr.usgs.gov/energy/WorldEnergy/WEnergy.html>

Left top—Graph showing world dependence on OPEC oil between 1973 and 2010. The higher the index value, the greater the probability of experiencing large price increases and the greater the impact on the economy. This 1994 EIA and USGS study demonstrates the high level of dependence on OPEC oil now and into the future.

Left bottom—Cumulative known oil volume plot versus discovery year for the Neuquen Basin in Argentina. This is an example of the types of data and methodologies to be used in forthcoming assessments.

