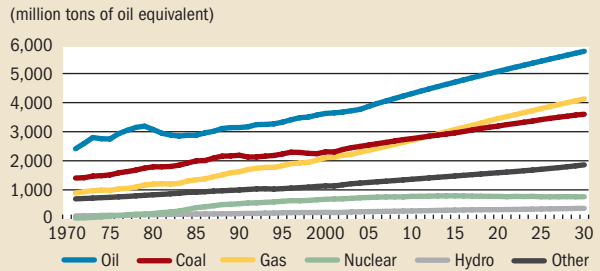


Energy (In)security?

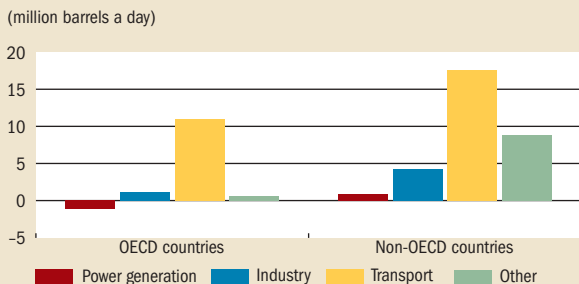
HOW is the global energy system likely to evolve over the next 30 years? The International Energy Agency paints a sobering picture in its *World Energy Outlook 2004*. If governments stick with current policies, energy needs will be almost 60 percent higher by 2030—with two-thirds of the increase in demand coming from developing countries, in line with their more rapid economic and population growth. Fossil fuels will continue to dominate the energy mix, while the shares of nuclear power and renewable energy sources will remain limited. Consumption of natural gas will almost double by 2030, overtaking that of coal within the next decade.

Fossil fuels will account for some 85 percent of the increase in world primary energy demand.



Oil will remain the single largest component in the primary energy mix, even though its percentage share will fall marginally. Demand for oil will continue to grow most quickly in developing countries.

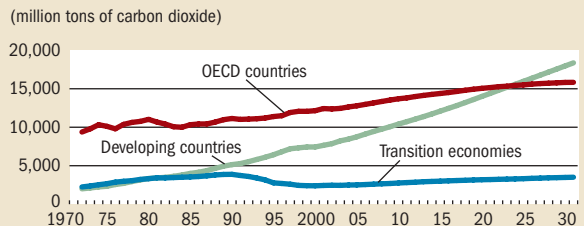
Most of the increase in oil demand will come from the transport sector, especially in OECD¹ countries.



¹Organization for Economic Cooperation and Development

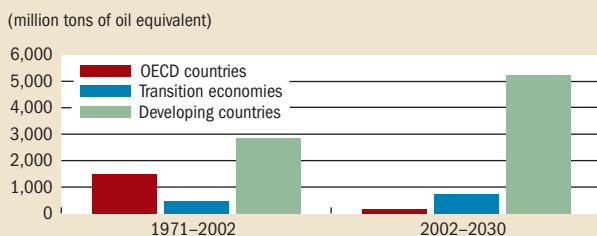
If government policies do not change, energy-related carbon dioxide emissions will be more than 60 percent higher by 2030. The average carbon content of energy, which fell markedly during the past three decades, will hardly change. Over two-thirds of the projected rise in emissions will come from developing countries, which will remain big users of coal, the most carbon-intensive fuel.

In the 2020s, carbon dioxide emissions in developing countries will overtake those in the OECD.

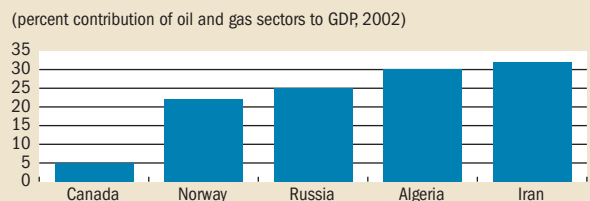


Global demand for oil is projected to grow by 1.6 percent a year, reaching 121 million barrels a day in 2030. Members of the Organization of Petroleum Exporting Countries (OPEC), mainly in the Middle East, are expected to meet over half of this need—an even larger share than in the 1970s. Rising demand for gas will have to be met by a small group of countries with large reserves, primarily Middle Eastern members of OPEC and Russia; the latter is likely to remain the world's biggest gas exporter. But output from Russia's old super-giant fields is declining, and huge investments in greenfield projects will be needed.

Almost all of the increase in world primary energy production will occur outside of developed countries.



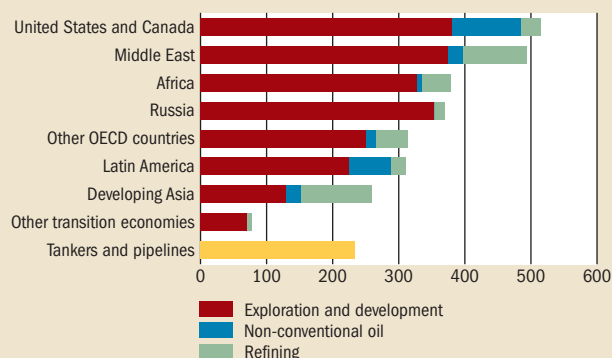
The role of oil and gas sectors in Russia has grown sharply in recent years, approaching that of some OPEC countries.



Converting the world's energy resources into available supplies will require massive investments—possibly some \$16 trillion from 2003 to 2030, or \$568 billion per year—with about half occurring in developing countries, where production and demand are set to increase most. The electricity sector will need the biggest chunk, some \$10 trillion, and the oil sector will need about \$3 trillion.

Over 70 percent of the projected \$3 trillion of oil-industry investment would go upstream.

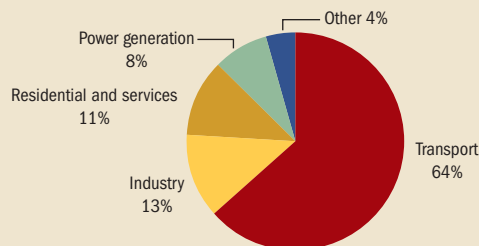
(billion dollars, 2000)



How would global energy trends evolve by 2030 if countries adopted a set of more energy-efficient and environmentally friendly policies? The *World Energy Outlook 2004* projects that global energy demand would be about 10 percent lower than otherwise—with the biggest drop occurring in fossil fuels, thanks largely to policies that promote renewable energy sources. The oil savings would be equivalent to the combined current production of Saudi Arabia, the United Arab Emirates, and Nigeria.

The transport sector would account for almost two-thirds of projected oil savings, with greater fuel efficiency and alternative-fuel vehicles.

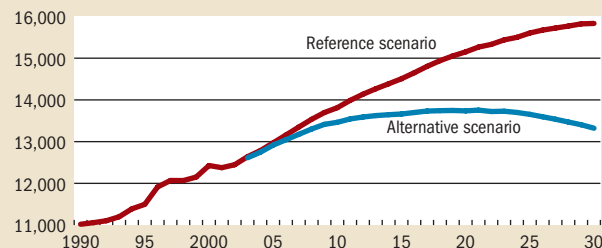
Oil savings from promoting renewable energy sources = 12.8 million barrels a day



Energy-related emissions of carbon dioxide would be 16 percent lower than otherwise—roughly equal to the combined current emissions of the United States and Canada. Almost 60 percent of the reduction would occur in non-OECD countries. In OECD countries, emissions would level off by the 2020s and then begin to decline.

Through stricter energy efficiency and environmental policies, energy-related carbon dioxide emissions from developed countries would start to drop in 2020.

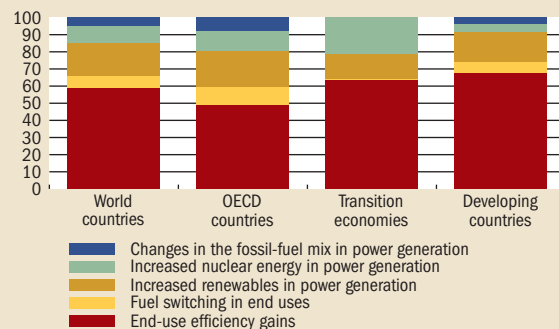
(million tons)



More efficient use of energy in vehicles, electric appliances, lighting, and industry would account for more than half of the reduction in emissions. A shift in the power generation fuel mix in favor of renewables and nuclear power would account for most of the rest.

Improvements in end-use efficiency could account for more than half of the decrease in emissions.

(percent, 2002–2030)



Based on the *World Energy Outlook 2004* study, directed by Fatih Birol, Chief Economist and Head of the International Energy Agency's Economic Analysis Division.