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## The G8 on Energy: Too Little

ENERGY SECURITY WAS A KEY ISSUE AT THE ST. PETERSBURG SUMMIT OF G8 LEADERS LAST MONTH. Their joint communiqué\* included many important commitments, but it omitted one crucial pledge: a significant increase in their governments' investments in R&D for energy technologies. The omission of energy R&D by the G8 reflects a worrisome lack of determination to accelerate the development of new energy technologies. The urgent challenge is to meet global demand [scheduled to rise by more than 50% in the next 25 years, according to the International Energy Agency (IEA)] while reducing the impact of greenhouse gas emissions on climate change.

The St. Petersburg communiqué provides a list of future actions focused on private-sector energy funding, but neglects to emphasize the importance of public-sector R&D funding for technologies that are too far from market. It is perhaps not surprising that the communiqué had little to say on government R&D expenditure. A paper published last October concluded that public-sector R&D investment in energy in most industrialized countries has fallen sharply in real terms, from peak levels in the early 1980s, with some stabilization in the 1990s.† That analysis demonstrated that the 11 IEA countries accounting for most of the world's energy R&D had all decreased expenditures as a proportion of gross domestic product between 1975 and 2003. Investments in major energy R&D program areas dropped by 53% between 1990 and 2003. Fossil fuels and nuclear power accounted for more than 90% of the aggregate decline, but there was also an overall drop of 5% for R&D on renewable technologies.

Analyses of these R&D budgets don't tell the whole story, but they do demonstrate that the governments of industrial countries are not facing up to the huge energy challenges that lie ahead. That is disquieting because the IEA is predicting that by 2030, based on current national policies, 80% of the world's primary energy demand will be met by fossil fuels. Meanwhile, nuclear, hydro, biomass, and waste will provide 17%, and other renewables, such as geothermal, solar, and wind energy, will only account for less than 2%.

As a result, the IEA projects that annual energy-related emissions of carbon dioxide will be 52% higher in 2030 than in 2003. Unless there is a radical change, the world will continue to become more reliant on fossil fuels beyond 2030. Without unfeasibly dramatic breakthroughs in carbon sequestration and energy efficiency, this will lead to proportionate increases in atmospheric greenhouse gas concentrations.

To deal with rising energy demands and rising greenhouse gas emissions, more needs to be done to develop new energy technologies that are currently far from market. Governments must play a lead role in stimulating this process by investing more in R&D. One benchmark is set by nuclear fusion, where current publicly funded research runs at around \$1.5 billion per year. But fusion is only one of the technologies that are not yet market-ready. Proportionate support of all other options surely would be a prudent investment in a world where the cost of worldwide energy consumption is measured in trillions of dollars. These R&D expenditures could be funded through carbon taxes or similar economic instruments, levied initially on the countries with the largest emissions.

Such a proposal may seem ambitious, but some commentators have argued that the energy challenge demands a high-profile response analogous to the Manhattan or Apollo project, but on a global, rather than national, scale. An initiative of this type by world leaders would, as happened after the initiation of the Apollo project in the United States, stimulate education and enrollments in science and technology. Will G8 leaders have the vision to announce such an initiative at next year's summit?

— Martin Rees

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\*G8 leaders 2006, *Global Energy Security* (<http://en.g8russia.ru/docs/11.html>). †P. Runci, *Energy R&D Investment Patterns in IEA Countries: An Update* (Pacific Northwest National Laboratory/Joint Global Change Research Institute Technical Paper PNWD-3581, 2005; [www.globalchange.umd.edu/energytrends&page=iea](http://www.globalchange.umd.edu/energytrends&page=iea)).



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