

The Key to Our Energy Future

In the current debate over the energy bill, one important factor is being all but ignored: A global renaissance in nuclear energy is gaining momentum, and it could have greater implications than any or all of the other proposed methods being discussed for dealing with our energy problems.

Today some 440 civil nuclear reactors, in 30 countries comprising two-thirds of humankind, produce 16 percent of the world's electricity. Under current plans, these nations will construct several hundred more reactors by 2030.

China and India will lead the way, but the expansion will be broad-based. Nuclear power will also extend to new countries as diverse as Poland, Turkey, Indonesia and Vietnam. Meanwhile, nuclear "phase-outs" in countries such as Italy and Germany seem sure to be reversed.

Around the world, there is a new realism about nuclear energy, a recognition of its essential virtue, which is its capacity to deliver power cleanly, safely, reliably and on a massive scale. This thinking is eclipsing old-school anti-nuclear environmentalism.

Increasingly, thoughtful environmentalists see anti-nuclearism as counterproductive. They worry not about the growth of nuclear energy but about the likelihood that it is not growing rapidly enough to produce the clean-energy revolution the world urgently needs.

Carbon fuel emissions — 900 tons each second — continue unabated, even as science warns that we are fast reaching a point of irreversible global warming with consequences for sea levels, species extinction, epidemic disease, drought and severe weather events that will disrupt all civilization.

To avert climate catastrophe, greenhouse emissions must be reduced over the next 50 years by 60 percent — even as population growth and economic development are combining to double or triple world energy consumption.

Every authoritative energy analysis points to an inescapable imperative: Humankind cannot conceivably achieve a global clean-energy revolution without a rapid expansion of nuclear power to generate electricity, produce hydrogen for tomorrow's vehicles and drive seawater-desalination plants to meet a fast-emerging world water crisis.

This reality requires a tenfold increase in nuclear energy during the 21st century. Fortunately, advances in technology and practice can facilitate this expansion by meeting legitimate public concerns:

■ **Safety.** In the two decades since Chernobyl, the global nuclear industry has built an impressive safety record that draws on 12,000 reactor-years of practical experience. A network of active cooperation on operational safety now links every nuclear power reactor worldwide.

■ **Arms Proliferation.** Illicit weapons programs of rogue regimes pose an ever-present risk. But strong, universal safeguards can ensure that civil nuclear facilities do not increase that risk. Security for the environment and against terrorism need not conflict.

■ **Cost.** Steady reductions in operational and capital

costs have already made nuclear energy highly competitive. Once governments begin to impose a real price on environmental damage — through emissions trading or carbon taxes — the balance will tilt decisively toward nuclear.

■ **Waste.** In truth, waste is nuclear power's greatest comparative asset. Unlike carbon emissions, the volume is minimal and can be reliably contained and managed. For a half-century, the civil nuclear industry has safely stored and transported all end products from electricity generation. For long-term storage, a scientific consensus favors deep geological repositories. Governments worldwide must follow the lead of Finland, Sweden, the United States and France by moving to construct such sites.

The scope of the environmental crisis requires that governments accelerate the nuclear renaissance. One essential element will be a comprehensive post-Kyoto treaty on climate. It must include all major nations

and yield a steady, long-term contraction in global emissions. The key is an emissions-trading mechanism that yields efficiency in clean-energy investment and a net flow of investment from North to South. This economic assistance will be the most cost-effective in history if it prevents the globally destructive

greenhouse emissions that will otherwise occur in the developing world.

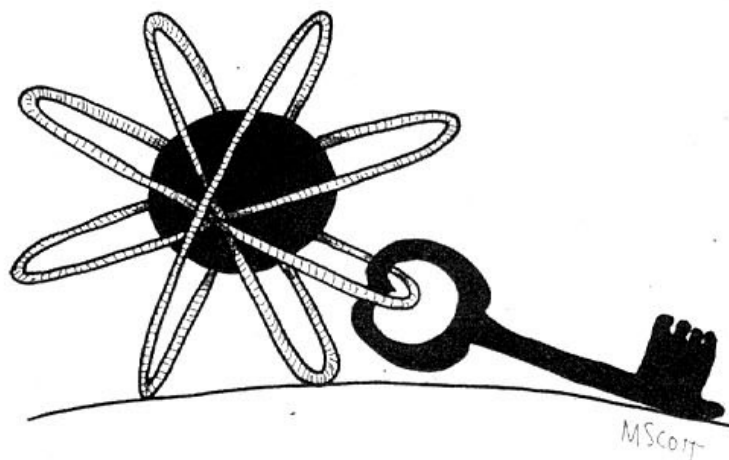
Another key is investment. Full-scale nuclear investment is still impeded by the absence of carbon penalties, the short-term bias of deregulated energy markets and the fact that 21st-century nuclear reactors have not yet achieved economies of scale. Governments must prime the pump using start-up aids such as loan guarantees and tax credits for first-of-a-kind engineering costs.

We need multinational investment, too. Today the major U.N. development institutions reflexively embrace unscientific prejudice while the International Atomic Energy Agency works alone to promote the peaceful uses of nuclear energy. Governments must now direct the World Bank and the U.N. Development and Environment Programs to pursue a clean-energy vision with nuclear power in a central role.

Recently, leading academic institutions in 25 countries formed a partnership called the World Nuclear University to build standards for a globalizing nuclear profession. To support this effort, governments worldwide should marshal their own resources — and we must summon the great philanthropies — to supply a global infusion of scholarship funds for studies in peaceful nuclear science.

Today technology is spurring a growth in world population and energy consumption that jeopardizes the future of our biosphere. Wisely used, modern technology can also be our salvation.

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