

attics, draught proofing windows. As the consumers opted for the soft path, energy shortages were transformed into gluts, and hard-path initiatives succumbed to market forces. From 1973 to 1986, US energy usage levelled off even as the gross national product grew by 35 percent – an historic accomplishment. Lovins' energy-efficiency revolution, once derided as visionary, was coming to pass. Events were proving the heretic right.

In 1982, Amory and his wife, Hunter Lovins, a lawyer and political scientist who helped start the urban-forestry group TreePeople, established Rocky Mountain Institute. A non-profit research and educational foundation, RMI works to "foster the efficient and sustainable use of resources as a path to global security." Half the institute's \$1 million annual budget comes from providing state-of-the-art information on efficiency to energy companies, utilities, and government agencies in more than 20 countries.

The institute is housed in a building the Lovinses designed to be a model of resource efficiency. Curvilinear stone walls, reminiscent of an Anasazi cliff dwelling, flank a greenhouse (complete with iguana and banana tree) that supplies virtually all of the building's heat. Everywhere is evidence of Amory's fondness for ingenious gadgetry. Flushing the Swedish toilets requires a mere gallon of water, the shower uses water-saving technology first developed for submarines, and the refrigerator is six times as efficient as the best commercial model. Floor-to-ceiling bookcases overflow with one of the world's most comprehensive energy libraries, a note on the photocopier says that operating it doubles the building's electrical use, and the table around which the RMI staff (earnest, bluejeaned, thirtyish) gather for lunch is covered with publications ranging from the *Wall Street Journal* to the *Utne Reader*.

Frenetic Schedule

Lovins is the key synapse in a global network of energy experts, and he maintains a frenetic schedule, travelling hundreds of thousands of miles a year. In truth Lovins is a driven man. He does not vacation.

According to RMI staffers, Lovins is motivated by the intellectual's quest for truth, the ecologist's reverence for linkages, and the economist's affection for efficiency. What irks him most is the careless, unthinking way so much energy is squandered.

And yet he is no puritan. "I'm not interested in doing with less," he says. "But in doing more with less. We don't have to become vegetarians and ride bicycles to save the Earth."

Though they care deeply about the environment, the Lovinses are careful not to bill themselves as environmentalists. "It's an ambiguous term that means different things to different people," says Amory. "We generally find it more effective to frame our arguments in economic terms."

Nonetheless, RMI routinely intercedes in environmental disputes involving energy. For example, in 1985 Lovins was asked by the Conservation Law Foundation of New England to analyze the energy needs of a paper company that wanted to build a controversial hydroelectric dam on Maine's Penobscot

River. Lovins discovered that improving electric-motor systems at the company's pulp mills would free up more energy than the dam could produce, at one-eighth the cost. By demonstrating that a cost-effective, practical, and environmentally benign alternative was available, Lovins played an important role in the eventual cancellation of the dam.

Two years later, Lovins critiqued a Department of the Interior report recommending that the Arctic National Wildlife Refuge be leased for oil drilling. Never one to mince words, he concluded that the department, which had failed even to mention efficiency and the role it might play in meeting the nation's energy needs, "should not shame its traditions, and expose its honest analysts to ridicule, by proceeding with this mendacious draft. It needs to be done over." Although Interior's report was never rewritten, the Sierra Club and other environmental groups have used Lovins' arguments as ammunition in their so-far-successful fight to prevent development of the refuge.

More recently, Lovins funded and helped direct an exhaustive study by RMI associates Bill Keepin and Gregory Kats that refutes the contention, fashionable among some editorial-page writers, that increasing our use of nuclear power is the best way to abate global warming. In fact, they found, improving electrical efficiency is nearly seven times more cost-effective than nuclear power for reducing carbon dioxide emissions.

Efficiency and national security are the Lovinses' bread and butter, but RMI is also active in water, agriculture and economic-renewal issues. Last March an RMI report concluded that an efficiency program could save Denver residents as much water as the proposed Two Forks Dam could provide, at one-fifth the cost. Two weeks later, Environmental Protection Agency chief William Reilly announced that he would scuttle Two Forks. Although Lovins does not claim credit for single-handedly nixing the dam, he does believe that the RMI report had some bearing on Reilly's decision. The Denver Water Board subsequently adopted an aggressive water-conservation program along the lines suggested by Lovins and his environmentalist allies.

Prophet Without Honour

Lovins now commands \$6,000 a day as a consultant and recently won a \$100,000 prize from the Onassis Foundation, but he was something of a prophet without honour during the Reagan years. ("No nation ever conserved itself to greatness," said the president). The irony is that Lovins' ideas have found a very receptive audience among many foreign leaders, including Soviet President Mikhail Gorbachev, several of whose top advisers maintain a relationship with Rocky Mountain Institute. One, Yevgeni Velikhov, was instrumental in the production of a 45-minute television film, *The Energy Efficiency Revolution – A Key to Perestroika*, which has been aired in the Soviet Union four times. Lovins and Velikhov are now collaborating on a book and have plans to build an international youth camp in Soviet Georgia that will be solar-heated and energy efficient.

Meanwhile, a number of recent developments have given Lovins' message new currency. By 1988 the US energy bill grew to

\$500 billion, with domestic oil extraction dropping and oil imports soaring. As OPEC regains its ability to put the screws on the West, some experts predict another oil crisis. At 17 million barrels a day, Americans are now burning as much oil as the Exxon Valdez spilled – every 20 minutes.

For years the public has confused efficiency with conservation, with Jimmy Carter in a sweater, with "freezing in the dark."

But efficiency does not mean curtailment or sacrifice. "Drilling for oil in our inefficient cars and buildings isn't instant or free," Lovins says. "But it's faster and much cheaper than drilling anywhere else."

It's also much better for the environment. Efficiency improvements not only reduce acid rain and urban smog, they are essential in the effort to stabilize Earth's climate – a goal that climatologist Stephen Schneider of the National Centre for Atmospheric Research believes will require cutting fossil-fuel consumption by half. "The conventional wisdom says that achieving such reductions will require draconian sacrifice," says Lovins, ever the heretic. "However, cutting carbon dioxide emissions through energy efficiency will save money and improve the quality of life here and abroad." To this end, RMI has recently begun an international outreach program to use less electricity in China, India and the Soviet Union.

As more politicians begin to understand that a sound energy policy would cause many other issues to fall into place, efficiency has gained powerful new allies. Lovins' intellectual fingerprints are all over the global-warming bills introduced by Senator Wirth and Representative Claudine Schneider (R-R.I.). Even President Bush's otherwise-flawed clean-air proposal acknowledges that energy efficiency can help control acid rain.

Yet despite efficiency's abundant promise, it may take another crisis before the federal government adopts it as a national goal. "History teaches us that men and nations behave wisely once they have exhausted all other alternatives," Lovins says, quoting Israeli politician Abba Eban. "We've worked our way well down the list, but we may not be at the bottom yet."

Regardless of what happens, Amory Lovins will continue as a torchbearer for efficiency. A man with a mission, he has a consuming desire to discover elegant solutions to vexing problems, large and small. ✎

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