



## RMI'S BOOK REPORT

### *Three New Titles are Hot Off the Press*

*From an end-use point of view, RMI is a publisher, and books are the least-cost way to reach much of its growing audience.*

One of RMI's founding principles is the end-use/least-cost approach: focus on the end use (cold beer, hot showers, or whatever) and then figure out the cheapest and best means to that end (which is likely to be energy efficiency rather than a new power plant).

A similar thought process can be applied to RMI itself. The Institute's product is information—happily, a renewable resource—but as word of our work has spread, demand for information has skyrocketed. How best to satisfy burgeoning demand with limited resources, and in what form should the information be delivered?

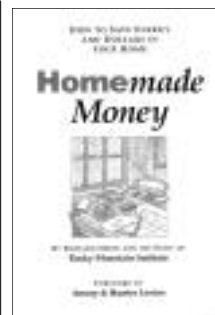
RMI has various types of end users, so researchers must present their findings in a variety of ways—as technical papers, articles, pamphlets, case studies, lectures, broadcasts, and, increasingly, books. Only recently has it begun to sink in that RMI is, from an end-use point of view, a publisher, and that books are the least-cost way to reach much of its growing audience.

By the time you read this *Newsletter*, RMI's book list should be three titles longer. These three are the first fruits of RMI's fledgling in-house publishing group. They will be followed in the coming year by at least two more.

#### **HOMEMADE MONEY**

It's been a long time coming, but it was worth the wait: *The Energy Efficient Home*, originally scheduled to be published a year ago, is about to hit the stands under the new title *Homemade Money: How to Save Energy and Dollars in Your Home*. The book is now being released as a joint imprint of RMI and the original publisher, Brick House Publishing Company.

Written by Rick Heede and the staff of RMI,



*Homemade Money* is the Institute's most practical book yet, aimed at anyone who lives indoors. It's an illustrated do-it-yourself manual devoted entirely to energy- and water-saving measures—literally hundreds of suggestions, backed up by user-friendly

discussion, are designed to help readers decide which measures will yield the biggest bang for their bucks.

Clear, concise chapters explain weatherization, insulation, heating and cooling systems, windows, water heating, appliances, and lighting. There's also a chapter on incorporating solar and other efficient design elements into new construction, and an extensive appendix listing everything from books to mail-order services.

In a way, *Homemade Money* is the ultimate popular application of RMI's energy-efficiency principles. All the themes are present: go for the best buys first, letting the money saved by one

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### The Newsletter

The Rocky Mountain Institute Newsletter is published three times a year by Rocky Mountain Institute, an independent, nonpartisan, nonprofit resource policy center in Old Snowmass, Colorado. Rocky Mountain Institute was founded in 1982. It has a staff of approximately 40 full-time, 45 total. The Newsletter is distributed from the Institute's headquarters to nearly 26,000 readers in the U.S. and throughout the world.

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#### LETTERS TO THE EDITOR

The editors of the RMI Newsletter want to hear your comments, criticism, or praise relating to any article printed in the Newsletter.

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### About the Institute

Rocky Mountain Institute is a nonprofit research and educational foundation with a vision across boundaries.

Seeking ideas that transcend ideology, and harnessing the problem-solving power of free-market economics, our goal is to foster the efficient and sustainable use of resources as a path to global security.

Rocky Mountain Institute believes that people can solve complex problems through collective action and their own common sense, and that understanding interconnections between resource issues can often solve many problems at once.

We focus our work in seven areas—Agriculture, Economic Renewal, Energy, Green Development, Security, Transportation, and Water—and carry on international outreach and technical-exchange programs. Our E SOURCE subsidiary (1033 Walnut, Boulder, CO 80302-5114, 303/440-8500, FAX -8502) is the leading source of information on advanced techniques for electric efficiency.

## PERSPECTIVES

By L. Hunter Lovins, Executive Director

Every few Novembers, it seems, one political party commandeers the ship of state, runs a new flag up the pole, and proclaims a "revolution." The fact is, the slow gears of Congressional compromise have a way of ensuring that political sea changes are never as radical as either side hoped (or feared). In the long run, that's part of the enduring wisdom of our political system, but occasionally, I do wish for a clean slate.

I remember the optimism Amory and I felt when the Reagan folks moved into the White House. We wrote an op-ed piece for *The Los Angeles Times* hailing what we thought would be the first Administration to apply least-cost economics to resources.



Dream on. The Reagan Administration blew more tens of billions of taxpayer dollars on nuclear power, which over its lifetime has soaked up more subsidy money than the space program and the Vietnam War combined—for a power source that delivers less energy than wood.

If it's now true that both political parties are agreed on the need to reduce federal spending, subsidies remain an excellent place to look for savings. Although energy subsidies have been trimmed somewhat since the Reagan days, taxpayers still pay \$36 billion a year to help the government make various energy options look cheaper than they really are. It would distort less if the cash were being doled out more or less equitably—but some fuels (notably nuclear and coal) receive up to 200 times as much subsidy per unit of energy provided as do energy efficiency and many renewables.

Subsidies can be direct or hidden. In our latest paper (see page 6), Michael Kinsley and I analyze the hidden subsidies that local authorities hand to land developers, leaving communities hooked on "socialized growth." That's an apt phrase, because it captures the bizarre contradictions contained in a system that worships

free markets without letting them work.

So when the new gang on Capitol Hill talks of cutting welfare, I wonder: welfare for whom? For the nuclear industry, which enjoys more than \$10 billion annually from the public trough? For Persian Gulf oil, which costs taxpayers \$50 billion a year for military readiness to protect its supply? For the automobile, which benefits from \$170 billion in highway funds and other subsidies each year?

C'mon, conservatives. Live up to your name and level the playing field. Let's provide Americans with realistic price signals that will encourage the most efficient use of resources. Maybe this time we'll see a real revolution. I'm still not ruling it out.



I came late to computers, having started working on one only last year. I grudgingly appreciate their power, but I don't naturally take to them.

That said, I'm convinced that a whole new world of digital opportunities beckons, even if my analog brain can't yet grasp them. That's why RMI has brought on board someone like Nat Irons to help us think through what they might be.

At 18, Nat is of a generation that's as comfortable with computers as I am with a pencil, and as the youngest serving member of the Berkeley Mac Users' Group advisory committee, he comes to us with experience beyond his years. During his internship with RMI, he'll be beefing up the Institute's presence on the Internet and, time permitting, surfing the Net in search of useful resources that can save RMI researchers from physically traveling to get information.

This internship is earning Nat credit toward graduation from Oakland's Beacon School this June. It seems there's just one catch: the P.E. requirement. Guess he'll have to join the RMI softball team this spring.

**RMI'S BOOK REPORT**

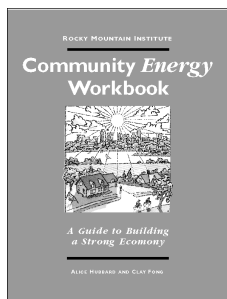
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measure pay for the next; start with end uses (such as showerheads and faucets) and work upstream toward the energy supply (such as the water heater); and cut losses in between to make the supply device smaller, simpler, and cheaper. Letting economics set the priorities will result not only in lower costs but also fewer wasted resources, less pollution, and, in most cases, a more comfortable home.

**COMMUNITY ENERGY WORKBOOK**

What *Homemade Money* does for individual households, the *Community Energy Workbook* does for neighborhoods, towns, and cities.

Drawing on the experiences of communities around the country, the *Workbook* outlines a proven, step-by-step process for achieving sustainable, community-wide energy savings. Written by RMI researchers Alice Hubbard and Clay Fong, the book demonstrates how energy efficiency can create jobs and revitalize local economies—and gives local officials and activists practical tools for making it happen.



Worksheets help users develop an “energy picture” for their community: analyzing energy use, calculating what percentage of total income is leaking from the local economy to pay for energy, tallying the environmental costs of that energy use, and finally estimating the economic benefits of energy efficiency.

RMI's early work in Colorado and elsewhere provided a framework for the *Community Energy Workbook*, which Hubbard and Fong honed in light of their work with dozens of successful local energy-efficiency efforts. Many refinements were added as a result of RMI's more recent involvement with the Energy 2000 project in Pitkin County (Aspen). These experiences give the book a strong empha-

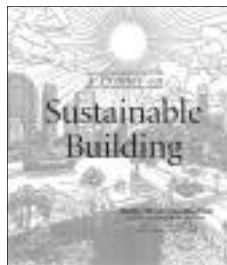
sis on human factors: much of the text is devoted to tips on mobilizing community support and harnessing the creative potential of residents through “energy town meetings,” workshops, and attention-getting special events.

**A PRIMER ON SUSTAINABLE BUILDING**

Architects write oddly and sometimes speak in a strange jargon, but deep down they're just like the rest of us. They don't have time to keep up with all the developments in their field and they have lots of books on their shelves that they've never read.

Realizing this, Dianna Lopez Barnett of RMI's Green Development Services set out a year ago to write a booklet that would introduce architects, home builders, developers, and students to the elements of green building design.

*A Primer on Sustainable Building* has since grown in scope and length—it's 135 pages—but its straightforward, non-technical presentation promises to make it a book that professionals actually read and use.



For many, the *Primer* will open up a new way of thinking about building design—one that is, ironically, rooted in ancient common sense. In the past half-century, architects and engineers have relied on oversized mechanical systems and cheap energy to overcome the appalling inefficiency of their creations. In contrast, green buildings not only operate more efficiently and generally cost no more to build, they also restore elements of comfort and beauty that were discarded in the postwar rush to modernity.

The *Primer* follows the process as designers normally go through it, from site selection to building materials to landscaping. Unlike other textbooks, which tend to focus on isolated elements

of sustainable design, the *Primer* looks at the process as a whole, stressing the inter-relatedness of each element and the importance of artfully integrating all of them.

**UPCOMING BOOKS**

Assuming it's not too late already, what is it going to take to keep humankind from going “beyond the limits”? How much more efficient must we be to reach some sort of sustainable equilibrium—twice as efficient? three times?

*Factor Four* (working title), to be published in the U.S. and Germany in late 1995 or early 1996, documents dozens of cases where fourfold (or greater) increases in resource efficiency have been achieved. The book, co-authored by RMI's Amory and Hunter Lovins and Ernst von Weizsäcker of the Wuppertal Institute in Germany, predicts that market forces will spur most of the necessary advancements, and argues that ecological tax reform and other market-signal corrections would make the transition far easier.

Case studies of successful resource-efficient buildings and developments will be the heart of *Green Development: A New Approach to Ecology in Real Estate*, now in the early stages of preparation. Drawing on RMI's extensive contacts in the green building field, the book analyzes the lessons learned from projects ranging from residential subdivisions to resorts, with accompanying full-color photos. RMI is currently negotiating with a publisher for this book, which is expected to be released in 1996.

In addition, a proprietary technical book from RMI's Hypercar Center is now in peer review (summaries will be widely published), and at least two additional RMI books are planned. 🌐

*For ordering information on Homemade Money, Community Energy Workbook, and A Primer on Sustainable Building, please see the flyer inserted in this Newsletter.*



## GREENING THE INNER CITY

### *RMI Joins a High-Profile Renewal Effort*

**R**MI is known for being ahead of its time, but its best measure of success is when the rest of the world catches up. For example, the electric utility industry thought Amory Lovins was crazy when he claimed, back in the 1970s, that it's cheaper to save energy than build new power plants. Twenty years on, "negawatts" are a \$5 billion-a-year business, and RMI has been able to spin off its "demand-side" information service for utilities into a renowned subsidiary, E SOURCE.

Likewise, when Bill Browning started RMI's Green Development Services in 1991, the building industry still thought of environmentally responsive design as "50 stupid things" you had to tack onto conventional designs to enter a new market niche. Now, a growing number of builders can see that green buildings often command a premium in the marketplace. Such is the level of interest that Green Development Services is booked solidly with consulting work.

As green development goes mainstream, GDS is focusing on projects that

have the greatest showcase potential. The latest high-profile assignment is the redevelopment of Homan Square in Chicago, a 55-acre inner-city site that was once home to Sears corporate headquarters.

Urban planners all over the country will be watching the ambitious project closely. Instead of following the usual urban "renewal" model—tear all the old buildings down, put up shiny new ones, and house the former residents in projects somewhere else—Sears and its partner, The Shaw Company, plan to refurbish the existing structures into business "incubators" that will revitalize the local economy.

Helping communities find and attract sustainable industry is right up RMI's alley, but that wasn't why it was brought in on Homan Square. To make the redeveloped commercial units affordable to local entrepreneurs, Shaw was aiming for an annual rent of \$6.50 per square foot—but just heating and lighting the spaces was projected to cost \$4.50 a foot. The numbers didn't add up. Shaw called RMI and E SOURCE to see if there were some way to reduce the energy costs.



*Homan Square: Urban planners all over the country will be watching.*

As with most such conversions, the answer is an emphatic yes: efficient design can not only cut operating costs (Shaw's main concern), it can also reduce capital costs because far smaller heating and cooling systems can be used. (And, needless to say, it also saves energy and pollution, and makes work spaces more pleasant and productive.) Together with Greg Franta of ENSAR, a Boulder, Colorado-based architecture firm, RMI staff met with the development team in late January to review the possibilities. An intensive design workshop is scheduled for later this spring.

In a similar vein, RMI has been hired by MPC, a Washington, D.C.-based development company, and the Student Loan Marketing Association (Sallie Mae) to advise its architects on designing environmentally responsive student housing.

In January, RMI hosted a meeting with the three architectural teams that will create prototype concepts for dorms in three representative climates: Southern California, Louisiana, and Washington, D.C. MPC, already a major developer of student housing, plans to base its future design bids on these contracts. In lieu of a consulting fee, RMI will receive royalties on each unit MPC builds. ➔

### "Bottom Line" Wins Kudos

If you didn't catch any of the media hoopla about RMI's "Greening the Building and the Bottom Line" study (highlighted in the previous *Newsletter*), you must have spent the past few months on a desert island. The study, demonstrating how energy-efficient design can boost employee productivity, was written up in well over 100 publications, including *The Wall Street Journal*, *Washington Post*, *New York Times*, *Architectural Record*, and *New Scientist*, to name but a few.

Summing up the study's far-reaching implications at a Washington, D.C. press conference in November, Assistant Secretary for Energy Efficiency Christine Ervin gave it the following ringing endorsement:

"I must confess I'm here largely for selfish reasons, because this collection of studies will make my job a lot easier... Now, for the first time, we have hard documentation on the kinds of benefits that boost labor productivity, and to a degree, I must say, that has surprised many of us. They document very clearly that since labor costs are much greater per square foot than energy costs, per se, management has even more reason to invest in cleaner, greener buildings."

If call volume to RMI's Outreach Department is any indication, management has gotten the message: since the report's release, several dozen national corporations have requested copies, often in bulk.

## REINVENTING THE RAILS

### *With Trains, Small Is Beautiful*

**H**ere's an idea that we didn't think of, but wish we had. Imagine a computer-controlled light-rail vehicle that runs on demand, weighs 90% less than a conventional train, requires 80–90% less infrastructure to run on, and at its ideal capacity uses 95% less energy than standard high-speed rail.

This train doesn't exist yet, but the Idaho National Engineering Laboratory (INEL) has developed a working prototype. CyberTran, as they're calling it, challenges assumptions about passenger rail that have gone unquestioned for more than a century.

It turns out that 70–80% of the total cost of a conventional rail system is in the guideway—the roadbed, tracks, bridges, and power lines. That's because the guideway must be designed to support train cars that weigh up to 100,000 lb. each. Cut the weight of the cars by a factor of ten and you get a corresponding reduction in guideway costs.

The easiest way to cut the weight of cars is simply to make them smaller, which means reducing their passenger capacity. Based on typical metro and intercity traffic, the CyberTran system uses one basic design that can be adapted for capacities ranging from six to 32 passengers per car.

A smaller vehicle capacity means more cars are required to car-

ry the same number of passengers, but those cars don't necessarily have to be strung together in one long, heavy train. CyberTran is an on-demand system, operating something like an elevator: being computer-controlled, the cars can run independently or together, depending on demand; during periods of low use, cars are distributed throughout the rail system, ready for rapid service.

CyberTran's versatility makes it almost as convenient as a personal auto, but three to five times faster (a fact that would not be lost on motorists, since the system is designed to be operated along the medians of Interstate highways). Over a 100–300-mile route—the system's target market—door-to-door journey times on CyberTran would be comparable to those on scheduled air services, taking into account check-in, boarding procedures, etc. Its round-the-clock, on-demand availability and its better performance in bad weather would be bonuses.

And the big payoff is in energy and environmental savings. INEL calculates that CyberTran would use just 7% of the energy per passenger-mile as a commercial airliner, and 10% of that of a single-passenger automobile.

But will the theory work in practice? We may not have to wait long to find out: the city of Boise, Idaho, is considering a test installation, and the idea will soon be presented in Aspen. 🌐

## INTRODUCING THE HYPERCAR

Regular readers of this *Newsletter* know that a supercar is a hybrid-electric vehicle capable of averaging 150 or more miles per gallon. But in the world of automobile enthusiasts, the term "supercar" usually means a street-legal Formula One racecar (which gets a couple of hundred miles per *hour*, not per gallon), and in the popular press it has increasingly come to mean a car of any design with modestly improved efficiency.

Seeking to nip any confusion in the bud, last fall RMI's supercar team started casting about for a new label. A few wags favored "superdupercar," but more sober heads prevailed and the supercar has now been officially rechristened the *hypercar*.

The supercar—sorry, hypercar—concept has garnered a huge amount of interest since being featured in a prominent story in January's *Atlantic Monthly*. The article, "Reinventing the Wheels," by RMI's Amory and Hunter Lovins with help from the rest of the hypercar team, paints a vivid picture of hypercar technology poised to usher in "the biggest change in industrial structure since the microchip."

"Imagine," the Lovinses write, "that one seventh of America's gross national product is derived from the Big Three typewriter makers." Through nearly a century of incremental refinements, these three industrial giants have developed the speediest, snazziest typewriters imaginable, and they do so profitably. There's just

one problem: small, upstart competitors are starting to invent wireless subnotebook computers.

Something very much like that is already happening in the auto industry, as RMI's hypercar team discovered in organizing a special three-day conference on hypercars in Aachen, Germany, last November. One of the conference highlights was the H301, a prototype four-seater hybrid-electric vehicle designed by Esoro, a small Swiss firm. A practical car for around-town uses, the H301 gets the equivalent of 140 miles per gallon. Although its power comes partly from battery electricity, and its overall design would have to be modified somewhat for American highway driving, the prototype illustrates the catalyzing role that emerging companies can play in reinventing the wheels.

Esoro is planning to develop a production version of its hypercar within about two years. It will have company: Microcompact Car (a joint venture of Mercedes-Benz and Swatch) and Solectria (one of the most successful American electric car manufacturers) are also aiming to roll out production models in the same time frame. The chance to become the auto-industry equivalent of Apple or Microsoft seems to be promoting keen competition among these start-ups—and that, in turn, is motivating the Big Three to take hypercars more seriously. Isn't it great when markets work the way they're supposed to? 🌐

## BEHIND THE GROWTH CURVE: HOW COMMUNITIES GET HOOKED ON "SOCIALIZED GROWTH"

### *A New RMI Paper Argues That Local Policies Unwittingly Encourage Sprawl, Strained Services, and Higher Taxes*

**T**he hurrier I go," said Alice in Wonderland, "the behinder I get." Communities around the country are feeling a little like Alice these days, as they discover that the growth that was supposed to solve their economic problems is only bringing bigger, more expensive ones.

On this side of the looking-glass, when projections go that far wrong, it's time to re-examine the assumptions. One of the most cherished assumptions in community planning is that growth generates more money in taxes than it demands in new services. But is that assumption valid?

RMI senior researcher Michael Kinsley takes on that question in a new paper, "Paying for Growth, Prospering from Development." Its thesis: local governments, by failing to take into account all the costs of expansion, skew the market and unwittingly encourage "socialized growth"—something that is in the interest of neither "conservative" growth advocates nor "liberal" growth opponents.

One of RMI's guiding principles is that markets can be wonderfully efficient at allocating resources, but only when prices reflect true costs. The Institute has long urged governments and utilities to remove distorting (and often unintended) subsidies that, for example, make nuclear power look cheaper than cleaner competitors. In his latest paper, Kinsley applies the same reasoning to land-use policies, arguing that faulty price signals in many areas have led to sprawl, strained services, higher property taxes, and a declining standard of living.

In recent years, several studies have indicated that residential growth usually results in net losses to public coffers, while commercial and industrial expansion may provide net gains but often does not. So why do communities keep rolling out the red carpet for growth?

Kinsley identifies four types of communities that feel, rightly or wrongly, that they need to grow. "Hungry" towns want growth to save themselves from a stagnant or declining economy. "Rusty" towns seek growth to upgrade old, deteriorating infrastructure or substandard services. "Debtor" towns rely on the revenue from growth to pay for existing infrastructure and services. And booming "Booster" towns believe that further growth will keep them riding a wave of prosperity.

Not all growth is bad, Kinsley notes; slow growth is manageable. In many cases, growth can genuinely improve Hungry and Rusty towns, but many are so desperate that they'll take anything. If they're not careful, their quality of life—often their primary salable product—will decline, and with it their hopes of attracting clean business, retirees, or tourists.

Debtor and Booster towns, especially, can easily become caught in a vicious growth cycle. Revenues from new growth often aren't enough to offset the costs of higher demand for schools, police, fire protection, roads, and sewers. Moreover, local governments rarely



*Contrary to popular belief, growth usually results in net losses to public coffers*

budget for replacing capital improvements until the replacements are needed, on the assumption that they will be covered by new revenues (read growth). The result is that the infrastructure demanded by growth must be paid for by a new round of growth that, in turn, will also fail to pay for itself, but on an even larger scale.

Meanwhile, governments usually spread the cost of new infrastructure evenly among all taxpayers, rather than charging it to those who created the cost. This raises taxes for longtime residents, most of whom experience little or no benefit from the growth. Because they don't understand the economics of growth, they, too, begin to call for more growth, thinking it will relieve their tax burden. The community is now growing just to stay in place, and even a slight slowdown can cause serious fiscal crisis.

Ironically, Kinsley notes, growth subsidies are highest where local government allows or encourages the sprawl of urban expansion into rural areas. The cost of providing services to rural residential subdivisions is disproportionately high, while taxes on rural subdivisions are disproportionately low. Rural expansion appears cheaper than it will, over time, turn out to be, which in turn encourages more people to move to rural areas and demand urban services.

Many communities attempt to correct the price signal by assessing "impact fees," which are intended to make growth pay its way. In theory these fees should work, but the fear of being sued by developers restrains officials from asking for much. And since impact fees usually don't cover future replacement costs, they can actually lull governments into the same old trap of relying on fees from future projects to

finance the upkeep of existing ones.

Kinsley is careful to distinguish between growth and development. Growth, he says, is an increase in quantity; development implies an increase in quality. Comparing communities to human beings, he notes that physical growth after maturity is known as cancer, yet development—learning new skills, discovering new interests and enterprises—can and should continue throughout life.

It's indeed true that growth creates jobs in a community. But Kinsley notes that sustainable development puts people to work, too—without requiring the expansion of ser-

vices that leads to higher taxes, and without degrading quality of life.

Kinsley—who, incidentally, served as a county commissioner in Pitkin County (Aspen), Colorado, for ten years—advocates transforming the hidden subsidies of "socialized growth" into a system of explicit charges and subsidies more in keeping with a community's long-term goals. For example, if the removal of growth subsidies pushes prices beyond the reach of young families, then the community can take the subsidy it would have previously given to a developer and use it to build subsidized housing for young

families. Such a policy would not expand the role of government, Kinsley argues, but would rather make government more accountable by clearly identifying what is and isn't being paid for.

"Paying for Growth, Prospering from Development" is an attempt to bring reason to the looking-glass logic of contemporary land-use policy. If it convinces local officials of the need to put a fair price on growth, Kinsley says, it will have done its job. Compared to that, designing the legal and technical means to do so should be relatively easy. ➔

## Jobs and the Environment

Speaking at an RMI retreat last fall, author/environmental entrepreneur Paul Hawken quoted a recent finding that 40 percent of Americans fear losing their jobs in the next six months. In a country where the debate is often framed as jobs versus environment, that bodes ill for the environment. Hawken urged RMI to go on the offensive by demonstrating how saving wasted resources and protecting the environment can create jobs.

Researcher Richard Pinkham was attending the retreat, got inspired, and in true RMI fashion, a project was born.

Pinkham's first chance to explore the issue in public came sooner than expected. Coincidentally (or perhaps not), Renew America, an environmental/community development research group, hosted a nationwide "Jobs and the Environment" teleconference on 31 January.

Billed as a "national town meeting," the event brought together leaders from the environmental community, business, labor, and the Clinton Administration to find common ground on a potentially divisive issue. The emphasis was on jobs *and* the environment, as opposed to the traditional view that tradeoffs are inevitable.

Local conferences were held in 20-odd cities immediately afterward. Together with several Colorado organizations, Pinkham organized the one in Denver, which focused on the job-creating potential of sustainable and renewable technologies in Colorado.

The forum, opened by RMI's Hunter Lovins and moderated by former Colorado Governor Dick Lamm, featured several well-chosen panelists:

- Tom Gougeon, chief executive officer of the Stapleton Redevelopment Foundation, detailed plans to convert part of Denver's old airport into an industrial park with an emphasis on environmental businesses, and to restore its environment using

green development principles advocated by RMI.

- George Van Dorn, general manager of Etta Industries, talked about his company's rapid expansion into one of the leading employers in the efficient-lighting industry.
- David Shelton, executive director of the Colorado Center for Environmental Management, described the Colorado Environmental Business Strategy, a new public/private effort to make Colorado a magnet for environmental research, services, and products.
- Phil Hall, chairman of the board of CH2M Hill, the nation's largest environmental consulting firm, predicted strong job growth from the clean-up and prevention of environmental damage caused by industry and development.
- Gary Laura, a county commissioner from Jefferson County, Colorado, discussed efforts to convert part of Rocky Flats, a former nuclear weapons plant located 15 miles from Denver, into a wind farm and environmental technology development site.

For Pinkham, who is now in the early stages of gathering case studies for a paper on the subject, the conference provided plenty of ammunition for the efficiency-means-jobs position. It is clear that retooling the economy for sustainability will generate millions of jobs.

But some deep, long-term questions remain. Once we get there, what does a sustainable economy's job market look like? Will less material throughput eventually mean fewer jobs, or might cyclical material flows demand more workers than the linear flows—raw material, product, waste—of our current economy?

Ultimately, says Pinkham, the outlines of a sustainable job market will become more clear as we move closer to it. In the meantime, increasing resource efficiency will provide jobs and hope for many, and will buy time in which to do even better. ➔



## A NEGADAM RUNS THROUGH IT

### *Ashland, Oregon, Learns a Lesson from RMI's Two Forks Analysis*

In 1989, when officials in Ashland, Oregon started discussing what to do about the expiration of a key water right in eight years, they realized they had a problem.

They called in a consulting firm, and the consultants told them yes, they had a problem, but it could be fixed by damming Ashland Creek, which would cost about \$11 million. For a city of fewer than 20,000 people, the price tag was dismayingly high, and officials feared voters would never approve a bond issue to build such a dam. Dick Wanderscheid, the city's conservation manager, recalls city council members' reaction to the dam proposal: "They're all going, 'I don't want to spend \$11 million.'"

While another town might have meekly submitted to the surgery, Ashland wanted a second opinion. Eight years earlier, the community had adopted a progressive set of energy-saving guidelines inspired by the writings of RMI's Amory Lovins and Hunter Lovins. That and a retrofit program sponsored by the local utility had shown local leaders that it was often cheaper to decrease the demand for electricity than to increase the supply. If it was possible to generate negawatts, was it possible to build a negadam?

In the West, where dams and diversions are the standard answer to water shortages, efficient toilets and low-flow showerheads are not typically considered serious policy alternatives. But Wanderscheid, who had read Amory Lovins's 1977 book *Soft Energy Paths*, began poring through the RMI literature for a precedent. He found one in Two Forks, a proposed dam outside Denver, which RMI had demonstrated in 1989 could be eliminated through simple efficiency—at a profit. The dam was cancelled.

"If RMI had not had the data on Two Forks that we could tap into, we probably would never have been able to convince the public works director and the council

that we should look into the demand side," says Wanderscheid.

The city commissioned a second study, this time by Synergic Resources Corporation of Seattle, to look into the feasibility of offsetting the lost water rights with efficiency measures. SRC's conclusion: Ashland could save 500,000 gallons a day—the same amount of water as would have been provided by the dam—through a relatively painless community-wide efficiency program. Some of the proposed measures would "create" water even more cheaply than it was costing the city to provide existing water (70 cents per cubic foot); all would do it more cheaply than the dam's \$2.80 per cubic foot. All told, the program would cost \$825,000—about one-twelfth that of the dam.

The city council approved the program in the spring of 1992, and by July, Wanderscheid's department was conducting home water audits and issuing rebates for efficient toilets and showerheads. Now, two and a half years into the program, Ashland residents are saving 134,000 gallons a day—about a third of the town's goal, and right on schedule for meeting it by the end of the decade. The program's projected cost has actually come down as water-efficient technologies have become cheaper.

The dam, meanwhile, would have only gotten costlier. By 1992 its price had risen to \$12 million. Worse, Wanderscheid believes that had Ashland proceeded with building the dam, the city would have had to charge so much for water that customers would have voluntarily curtailed their use—a "death spiral" scenario in which the dam, once built, would render itself unnecessary and unrepayable.

Water savings—and a freely flowing Ashland Creek—aren't even the end of the story. Ashland's negadam saves residents more than 500,000 kilowatt-hours a year on water heating, thanks mainly to efficient showerheads, and reduces waste-

water treatment volume by 43 million gallons annually.

Although RMI played no direct role in Ashland's water program, Wanderscheid credits the Institute as its inspiration. "He has planted seeds all over the place," Wanderscheid says of Amory Lovins, "and some of them are sprouting now." 🌱

### *Bigger and Better Briefs*

RMI's *Home Energy Briefs* series (see the Spring '94 *Newsletter*) has expanded in scope and, we trust, its reach.

Three new titles have been added (two of them replacing the original "Appliances" brief), bringing the total to seven. The current lineup: "Lighting," "Windows," "Refrigerators & Freezers," "Water Heating," "Cooking Appliances & Dishwashers," "Washers, Dryers & Miscellaneous Appliances," and "Computers & Peripherals."

The four-page briefs, which give introductions to energy-saving technologies and techniques, were originally intended simply to take the burden off RMI's outreach staff by providing written answers to frequently asked questions. Once in print, it became clear that the series had the potential to educate a much wider audience about the benefits—financial as well as environmental—of energy and water efficiency. RMI is currently investigating the feasibility of selling briefs in bulk to utilities, which would distribute them free to their customers.

### *Thanks, EBN*

No resource policy institute is an island. RMI receives help from all sorts of kindred organizations. One such is *Environmental Building News*, which provided invaluable assistance in the preparation of *A Primer on Sustainable Building* (see page 3). To subscribe, write EBN at RR1, Box 161, Brattleboro, VT 05301, or call (802) 257-7300.

## Margaret Frantz Fellowship Established

RMI has established an annual 12-week fellowship in memory of Margaret Frantz. Candidates will be favored who have completed a degree in a technical discipline related to RMI's work in energy, water, community economic development, environmentally responsive real estate development, or transportation, and who plan to pursue a graduate degree. The fellowship will provide housing, a food allowance, and \$100 per week.

A longtime friend of RMI, Margaret Frantz was a gifted musician, enthusiastic mother, master gardener, and imaginative cook. She was active in Boulder Ecocycle and lived her own life as an example of minimal consumption. She died in 1989 after a six-month battle with lymphoma. Her parents, John and Mary Frantz, have continued her support of RMI with generous gifts in her name.

Those interested in applying for the fellowship should contact Mardell Burkholder at RMI, (970) 927-3851. 🌐

## New Staff



*RMI would like to welcome four new staff members (left to right): Timothy Moore, research associate in transportation; André Lehmann, research intern in energy; David Cramer, research intern in transportation and energy; and Sandy Rounds, secretary to the director of development. We'd also like to bid farewell and good luck to John Barnett, now with the Institute for Defense Analyses in Washington, D.C.; Dianna Lopez Barnett, who is continuing her green development work as a consultant in Washington; and Jim Dyer, who is working as a Colorado-based consultant in the water and agriculture fields*

## New Publications

### ECONOMIC RENEWAL

**ER95-5.** "Paying for Growth, Prospering from Development." This analysis of typical local land-use practices reveals the ways in which local governments unwittingly worsen growth problems in their attempts to solve them (see article, p. 6). 14 pp, \$7

**ER95-4.** *Community Energy Workbook.* A step-by-step guide to revitalizing local economies through community-wide energy savings (see cover story). 270 pp, \$16.95 plus \$2 shipping & handling

### GREEN DEVELOPMENT

**D95-2.** *A Primer on Sustainable Building.* An introduction to environmentally responsive design (see cover story). 140 pp, \$16.95 plus \$2 shipping & handling

### ENERGY

**E94-32.** "Energy Efficiency Pays." Letter to *The New York Times*, rebutting the op-ed, "It Costs More To Save Energy." 2 pp, \$1.50

**U94-30.** "Spread the Costs of Electricity Fairly." Letter in *The Christian Science Monitor*, explaining how "retail wheeling" isn't happen-

ing and is in the best interest of neither electricity consumers nor efficiency. 1 p, \$1.50

**U94-34.** "Perspectives on DR Planning Under Competition." Interview with Amory Lovins on how the California PUC's proposed new regulations could affect the future of distributed resources planning. 3 pp, \$2

**E95-3.** *Homemade Money: How to Save Energy and Dollars in Your Home.* A practical do-it-yourself manual (see cover story). 276 pp, \$14.95 plus \$2 shipping & handling

**E95-15.** *Home Energy Briefs.* A series of seven leaflets on energy-saving tips: "Lighting" (E95-8), "Windows" (E95-9), "Refrigerators & Freezers," (E95-10), "Water Heating" (E95-11), "Cooking Appliances & Dishwashers" (E95-12), "Washers, Dryers & Miscellaneous Appliances" (E95-13), and "Computers & Peripherals" (E95-13). Sold separately or as a set. 4 pp each, \$2 each or \$10 for the set

### TRANSPORTATION

**T94-29.** "Reinventing the Wheels." Reprinted from the January 1995 *Atlantic Monthly*, this wide-ranging, non-technical article explains why

hypercar technology may trigger the most profound industrial shifts since the microchip. 10 pp, \$5

**T94-31.** "Amory Lovins' Dream Car." An article that originally appeared in *New Age Journal*, giving a lucid introduction to the hypercar. 1 p, \$1.50

**T95-1.** "Hypercars: Answers to Frequently Asked Questions." Non-technical summary of everything you wanted to know after reading the *Atlantic* article (T94-29). 6 pp, \$3

**T95-6.** "Hypercars and Today's Cars: An Illustrated Comparison." Annotated illustrations show how a conceptual hypercar would differ from a typical 1995 family car. 2 pp, \$1.50

**T95-16.** *Hypercar Packet.* A roundup of recent articles on hypercars; includes the above three publications plus several reprints from past *Newsletters*. 16 pp, \$5

**T95-18.** "Advanced Ultralight Hybrids: Necessity and Practicality of a Leapfrog." Technical remarks to a February symposium on Next Generation Vehicles. 10 pp, \$5



# 1994 FINANCIAL RECAP

Another year and we're still here... livelier than ever, but no less the nomadic hunter-gatherer. We'd like to express our deepest gratitude to the many supporters who helped RMI forage, thrive, and expand its influence in 1994.

Special thanks go to the Joyce Mertz-Gilmore Foundation, whose \$500,000 interest-free loan in 1994 now supports a cashflow-reserve line of credit that gives the Institute, for the first time, a modest safety net. This reserve helps us sleep better, even though we hope we never have to use it—and, with your continued support, shouldn't need to.

According to preliminary financial figures, here's how 1994 panned out for RMI:

- Expenditures rose by 7% to \$1,841,200, due mainly to an expanded staff (now up to 40 full-time).
- Revenues fell by 14% to \$1,503,290. Nearly all of this decline, however, was attributable to a \$218,426 deferral of grant revenues to 1995.

- Despite the accrual-basis deficit posted in 1994, RMI's cash position remained unchanged from 1993, thanks mainly to the deferred grants and interest earned on the Mertz-Gilmore money. Working capital—a key indicator of financial health for nonprofit institutions—continued to hover at just over \$100,000.
- Including the deferred portions, foundation grants—the Institute's main source of revenue—increased to \$994,456, up 3% from the previous year.
- Individual contributions dipped to \$222,413 from 1993's high of \$232,693. The decline was in line with those experienced by most other environmental organizations last year, and didn't reverse a long-term upward trend (1992's contributions totaled \$78,000).
- Corporate gifts increased to \$75,160, compared with \$64,385 in 1993, reflecting Green Development Service's work with corporate clients.

## Facilities Improvement Fund

RMI's headquarters contained a lot of "firsts" when it was completed in 1983, including probably the first application of argon-filled Heat Mirror window technology. Those early prototype windows were an essential ingredient in the building's energy-efficient design, but this summer, after 12 years of more humid than anticipated conditions, many need replacement. Manufacturers have already pledged to donate new Heat Mirror and glass (with new waterproof seals), but the Institute will have to pay for the installation.

Other capital projects coming up include roof repairs (due to the cumulative wear and tear of visitors' feet—the best possible sort of roof problem, we think) and computer and telephone upgrades.

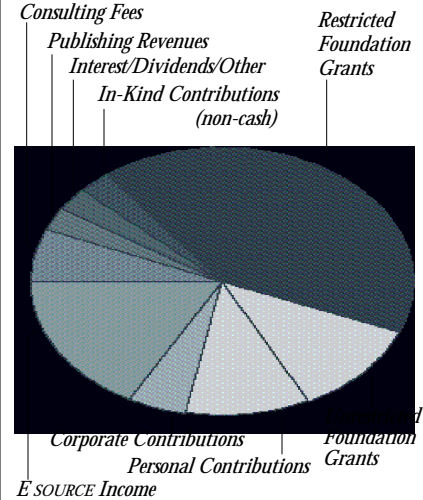
Such capital expenses present a chance for supporters to play a vital role in underwriting RMI's work, by lending money to

the Institute's Facilities Improvement Fund. RMI doesn't borrow for operating expenses, but it is prudent for a nonprofit to finance capital expenditures that would otherwise drain reserves.

Lenders profit from interest rates which, although a bit lower than some commercial rates, are still attractive. Notes are typically level-payment, with a variety of maturities, and with values from \$10,000 to \$50,000. The Institute takes pride in having a perfect repayment record, and a diversified income 25 times larger than its debt service.

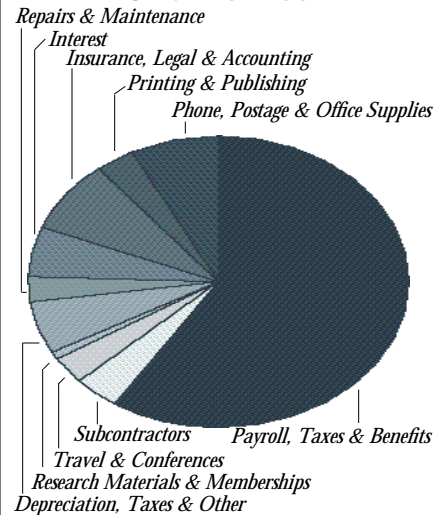
If you have maturing CDs or other funds that could be better employed in serving the earth, please contact RMI's Treasurer, Amory Lovins. And to the approximately 40 holders of outstanding RMI notes, again, we appreciate your investment in the Institute's future.

### SOURCES OF REVENUE



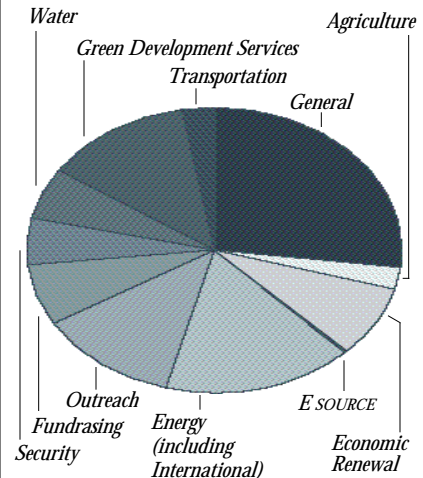
**Total Accrued Revenue: \$1,503,290**

### EXPENDITURES BY CATEGORY



**Total Accrued Expenditures: \$1,841,200**

### EXPENDITURES BY PROGRAM



**Total Accrued Expenditures: \$1,841,200**

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Our sincere appreciation is offered to these friends who have contributed to RMI's support between 1 September and 31 December 1994. Numbers in parentheses indicate multiple donations. Please let us know if your name has been omitted or misspelled so it can be corrected in the next issue.

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