



# ROCKY MOUNTAIN INSTITUTE

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## NEWSLETTER

### NATURAL CAPITALISM

#### *Creating the Next Industrial Revolution*

Before the Industrial Revolution, there were few machines to multiply labor. A worker's output was essentially fixed, like a horse's: if you wanted two horsepower, you literally had to have two horses.

Now, of course, we can fit several hundred horses under the hood of a car, and our per-capita output is vastly higher than what our ancestors produced with hand tools and beasts of burden. Which is the main reason material standards of living have risen so dramatically over the past couple of centuries—and why labor productivity remains one of economists' and industrialists' chief preoccupations.

But conditions have changed since the start of the Industrial Revolution. Then, natural resources were abundant, people relatively scarce. Now, there's a surplus of people, while nature is in decline. Saddled with an outdated view of the world, our economic system wastes both resources and people.

The next industrial revolution, like the last one, will be a response to changing patterns of scarcity. It will transform industrial processes and business practices to economize on what is now the limiting factor of production—*natural* capital. It will create undreamed-of new wealth for its practitioners and for society.

And it's already under way.

That's the message of *Natural Capitalism: Creating the Next Industrial Revolution*, the new book by bestselling author Paul Hawken and RMI co-founders Amory and

Hunter Lovins. A groundbreaking blueprint for a new economy, it describes a hopeful future in which business and environmental interests merge, and in which corporations will play a pivotal role in bringing humanity back within its planetary limits.

#### AS IF

"Natural capital" refers to the natural resources and ecosystem services—air and water purifica-

tion, climatic stabilization, waste detoxification, and so on—that make possible all economic activity, and indeed all life. Ecosystem services are of immense economic value; some are literally priceless, since they have no known substitutes. Case in point: in 1991–92, the \$200-million Biosphere II project in Arizona was unable to sustain breathable air for eight people. Biosphere I—Earth—performs this task daily at no charge for six billion.

Current business practices essentially assign no value at all to ecosystem services other than the indirect costs imposed by

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environmental regulations. As a result, “industrial capitalism” defies its own logic. Instead of reinvesting in its largest stock of capital, it’s spending its 3.8-billion-year store of natural capital as if it were income—and at the current burn rate it’ll

nologies and techniques, the business opportunities are increasing all the time.

*Natural Capitalism* offers hundreds of examples of companies that are pioneering the next industrial revolution by availing themselves of these opportunities. They’re improving their bottom lines today and

one is worth doing on its own, but the greatest benefits come from implementing all four together.

### RESOURCE PRODUCTIVITY

Back in the mid-1700s, if anyone had predicted that in 70 years one person could do the work of 200, he would have been laughed out of the pub. In the same way, most of today’s leaders scoff at the idea that a gallon of gasoline or a board-foot of lumber could be used ten or 100 times more productively than it is now.

Yet given finite resources and a growing population, that’s what must happen if we hope to enjoy sustained prosperity while enabling poorer nations to satisfy their aspirations.

As it happens, we’re so darned wasteful now that it shouldn’t be hard to achieve such radical gains in efficiency. Only six percent of the vast flow of materials in the U.S. economy—more than a million pounds per American per year—ends up in products, and much of that is packaging. The efficiency of converting fuel from a power plant into light from a standard bulb is only three percent. And after a century of development, today’s cars use only one percent of their fuel energy to move the driver. The difference between these dubious achievements and what’s possible represents a vast business opportunity worth several trillion dollars a year in the United States alone.

Advanced resource productivity is the no-brainer of natural capitalism. Efficient new products—from lighting to air-handling systems to vehicles—are readily available and constantly improving, the savings are reasonably quantifiable, and almost any business can make stellar returns by investing in efficiency. Moreover, efficiency typically produces collateral benefits such as greater comfort (efficient buildings are less drafty), cleaner air, less noise, and greater employee satisfaction (which, incidentally, can translate into higher productivity). *Natural Capitalism* is full of examples of profitable advances in resource productivity in the automobile, real estate, timber, manufacturing, agriculture, and water industries.

### Nat Cap Fact:

*Today’s best techniques for using wood fiber more productively could supply all the paper and wood the world currently requires from an area about the size of Iowa.*

be largely gone in a century. That’s not a good survival strategy for a company or for its customers.

Maybe someday business will be forced to value natural capital properly, but don’t hold your breath. Fortunately, we don’t have to wait. It’s usually more profitable to do business *as if* natural capital were properly valued, even when (as now) it’s valued at zero. And thanks to efficient new tech-

giving themselves a competitive edge for tomorrow. Not only that, their leaders and employees are feeling better about what they do: firing the unproductive tons, gallons, and kilowatt-hours often makes it possible to keep the people, who foster the innovation that drives future success.

The journey to natural capitalism involves four major shifts in business practices. They go together as a package: any

## Natural Capitalism on the Web

*If this article makes you want to know more about Natural Capitalism—heck, even if it doesn’t—check out [www.naturalcapitalism.org](http://www.naturalcapitalism.org). The site is chock-full of information, including the entire book in downloadable format, browsable excerpts, discussion groups, updates, reviews, a calendar of events, and media materials. All that and not a single tree cut down!*

With resource productivity, no one has to choose between business and the environment: what's good for one is good for the other. In fact, the massive inefficiencies that are causing environmental degradation almost always cost more than the measures that would reverse them.

Resource efficiency postpones depletion while improving environmental health, buying time for even better techniques. And the money it saves can finance investment in natural capitalism's other three principles.

### ECOLOGICAL REDESIGN

The standard industrial model of our age is a linear sequence of "take, make, and waste." Raw materials come from somewhere (enter nature, stage left); products are made; and the wastes from production processes, and soon the products themselves, are somehow disposed of somewhere else (exit waste, stage right). Nature's

capacity to provide materials and absorb wastes isn't really the concern of this model. Needless to say, it's processes like this that are eroding our stock of natural capital by depleting resources and replacing

more common in the United States if government subsidies didn't reward waste and maintain artificially low prices for virgin materials. In Germany, where most companies are legally responsible for disposing

### Nat Cap Fact:

*STMicroelectronics—the world's ninth-largest semiconductor firm, and a client of RMI's Natural Capitalism Practice—announced in October its commitment to zero net carbon dioxide emissions by 2010. The company plans to meet that target through a combination of cogeneration, efficiency, and tree planting.*

them with wastes.

Biological systems, in contrast, operate in closed loops. There's no waste—every output either is returned harmlessly to the ecosystem as a nutrient, like compost, or becomes an input for another process.

Closed-loop industrial systems would be

of their products, manufacturers are motivated to design cars and computers for remanufacture, turning waste back into value.

But even without such legislation, the economics of resource productivity are

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## Nat Cap Buzz

The buzz about *Natural Capitalism* started before it even hit the bookstores. Here's a sampling of news bulletins reported at [www.naturalcapitalism.org](http://www.naturalcapitalism.org):

**22 August:** Hunter and Amory Lovins managed to catch a few minutes with President Bill Clinton and First Lady Hillary Clinton at an Aspen fund-raiser, and presented the Clintons with pre-publication copies of *Natural Capitalism* and an article based on the book that appeared in the May–June *Harvard Business Review*. Separately, mutual friends presented copies to Republican presidential front-runner George W. Bush and Democratic candidate Bill Bradley. So it looks likely that natural capitalism will be on the campaign radar in 2000.

**16 September:** Hunter Lovins met briefly with Vice President Al Gore after a reception for ECO (Earth Communications Office), a Hollywood environmental organization on whose board she serves. Lovins gave the Democratic presidential hopeful a copy of *Natural*

*Capitalism*.

**30 September:** The American edition of *Natural Capitalism* sold out before its publication date, and publisher Little, Brown rushed it into a second printing (it's since gone into a third printing, and a fourth is planned). A separate British edition was published simultaneously by Earthscan. The book will be translated into German and published by Bertelsmann in early 2000, and translations into French and Mandarin are in negotiation.

**5 October:** President Clinton plugged *Nat Cap* at a Democratic National Committee dinner: "It used to be that you couldn't grow a modern economy and get a whole people rich unless you burned a lot of coal and oil. That is not true anymore.... There's a new book out I commend to you by Paul Hawken and Amory

and Hunter Lovins called *Natural Capitalism*, and if you read it, you will be convinced that whatever you're doing and however well you're doing it, you could make a lot of money on the side by getting into alternative sources of energy and energy conservation. This is a huge deal."



**15 October:** The following item ran on the front page of *The Wall Street Journal*: "CLINTON CREDITS his reading of *Natural Capitalism: Creating the Next Industrial Revolution* for sparking a 'big idea' that he repeats regularly. Developing countries don't need to be energy hogs to become rich; that was the old-style pattern of the industrial revolution."

Further updates will be posted regularly at the website under "Nat Cap News."

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already encouraging industry to shift to biologically inspired production models that don't just reduce waste but eliminate the very concept of waste. Eco-industrial parks provide venues where one tenant's "waste" is another's "food." DuPont is now closing the loop on its \$800-million-a-year polyester film business—thanks to a new process of "unzipping" polyester molecules, the company is able to take back used film from its customers and recycle it more cheaply than making new film from virgin materials. Many other companies—from pallet distributors to makers of "disposable" cameras—are finding profitable ways to reuse or recycle their products.

Meanwhile, growing competitive pressures to save resources are inspiring companies to turn away from mechanical systems requiring heavy metals, combustion, and petroleum, and instead emulate nature's life-temperature, low-pressure, solar-powered assembly techniques, whose products rival anything human-made. We can look forward to the end of the witches' brew of dangerous substances invented this century, from DDT and PCBs to CFCs and PVCs, that were created to accomplish functions that can now be carried out far more efficiently with biodegradable and naturally occurring compounds.

### SERVICE AND FLOW

Dow Chemical sells industrial solvents, but nowadays it prefers to lease "dissolving services." Dow owns the solvents, loans them to its customers as needed, then recovers them for reprocessing and reuse.

That's the third principle of natural capitalism: moving from the sale of goods to the delivery of a continuous flow of services. This subtle shift in the producer-consumer relationship can have profound implications. When you're in the business of selling products, you have an incentive to make them cheaply and persuade con-

sumers to buy lots of them; how long the products last, and how much it costs to operate or dispose of them, are secondary concerns. But when you lease the *service* that the product provides, suddenly you and your customer are on the same side of the table. You're both rewarded for accomplishing the service in ever cheaper, more efficient, and more durable ways. Not only



Amory Lovins

*A case study that rates its own chapter in Natural Capitalism, Curitiba, Brazil is perhaps the world's best example of natural capitalism at the municipal level. This photo shows one of Curitiba's innovative "tube stations," an integral feature of a bus system that provides all the convenience and capacity of subway trains at less than one percent of the cost.*

that, the producer benefits from reduced risk (no inventory backlogs and surpluses), while the customer gets automatic upgrades without the responsibility of owning and disposing of the product.

Almost by definition, this "service-and-flow" business model is better for the environment because it rewards the producer for reducing, reusing, and recycling. That reinforces natural capitalism's first two principles—especially when it reveals ways to

satisfy the end use while eliminating the product altogether. For example, instead of being paid by the square centimeter of parts degraded, Dow's German subsidiary can even be compensated for improving a customer's process to reduce or eliminate the need for solvent in the first place. Air conditioner manufacturer Carrier now offers cooling services, where its specialists work with clients to retrofit their buildings so that they need little or no air conditioning—better service at lower cost.

### INVEST IN NATURAL CAPITAL

Investment in natural capital is the last, and so far the least implemented, of the four principles. Companies in certain industries—forestry and tourism, for example—have clear incentives to look after their own stocks of natural capital, though even they don't necessarily do so. And as far as most of the others are concerned, investing in natural capital seems to make no sense because the returns on any investment have to be shared.

That situation may be changing, though. As natural capital becomes scarcer, its price is going up, even if companies and governments don't actually reflect it on their balance sheets. Certain signals—higher landfill fees, insurance claims from climate-change-related storms, consumer preference for green companies—are influencing business decisions and making investment in natural capital look more sound.

### Nat Cap Fact:

*Seeing that their students were annually turning \$8,000 worth of reagents into hazardous waste that cost \$16,000 to dispose of, University of Zurich chemistry professors redesigned some exercises to teach instead how to turn the residues back into reagents. Result: a 99-percent reduction in waste, and annual savings of \$20,000 in operational costs.*



Capital begets more capital; a company that depletes its own capital is eroding the basis of its future prosperity. In time, companies will realize that the forms of capital they've been investing in—manufactured and financial capital—are ultimately dependent on the health of natural capital.

### A WAY FORWARD

There are many things that can and should be done to protect the environment; *Natural Capitalism* focuses on the ones that are profitable. It doesn't preach or bash big business, but instead builds a powerful case for the sheer money-making potential of a more environmentally friendly business model.

That emphasis may not appeal to some environmentalists, concedes co-author Amory Lovins, but he makes no apology for it. "I think profits honorably earned can serve the wider society as well as the shareholders," he says. "We offer a set of operational principles for right livelihood that anyone should be proud to pursue."

But the book taps into more than just rational self-interest. "As we go around talking to business people, we're finding an increasing number of them don't want to be part of the problem," notes Hunter Lovins. "Their motivation is not, How do I make the most money in the shortest amount of time, but rather, What legacy can I leave for my children and for the world? And they're realizing that there is not a contradiction between making money—making a *lot* of money—and leaving this legacy."

*Natural Capitalism* resolves this contradiction. Transcending ideology, it offers solutions that every reader—from environmentalists to corporate executives—can agree on. It shows a way forward that seems truly achievable because, as the book's closing words state, "it is necessary, possible, and practical."

—DAVE REED

*Natural Capitalism* is published by Little, Brown in the United States and by Earthscan in Europe. You can order it from RMI for \$26.95 plus shipping and handling (see page 12).

## BAD GUYS AND GOOD BUSINESS

By L. Hunter Lovins, co-CEO (Strategy)

In 1994, U.S. Coast Guard jets noticed a black slick behind Royal Caribbean's cruise ship *Sovereign of the Seas*. According to a recent *New York Times* story, the ship had been releasing oily wastes, bypassing pollution control equipment to save money. Shortly after the company admitted the crime and paid \$9 million in fines, another Royal Caribbean ship was caught dumping waste.

The story struck a nerve for me. A self-contained cruise ship ought to be a prime candidate for a natural capitalist approach to waste reduction: find ways to reuse the waste so you don't have to treat it, or, better yet, design the system from the beginning so it has no waste and is cheaper to run.

"We could help that business," I thought—"and the ocean, while we're at it."

Some environmentalists think we're daft: the multinational ocean liner company should be considered the enemy. Half of the world's hundred largest economic entities are no longer countries, they're companies. How do you regulate that? Yet RMI has long argued that corporations are the leverage point for change. We must, in effect, enlist the world's major polluters to save the planet. It's tempting to say, "That dog don't hunt." I guess our job is to teach it to, even if the process is controversial.

And plenty of companies are learning—enough to fill a book, in fact. When we set out to write *Natural Capitalism* (see [main story](#)) we knew of a few of them, but as we got deeper into the research we were heartened to find that dozens of firms are putting the principles of natural capitalism

into practice.

Consider Interface, the world's largest carpet-tile maker. It's implementing three of the four principles of natural capitalism. Five years ago Interface started on the first—resource productivity—when it made a company-wide commitment to eliminate waste. Next it created the Evergreen

Lease, which is transforming Interface's business from selling carpeting to leasing floor-covering services—exemplifying the third principle. Since only 20 percent of a typical office carpet suffers 80 percent of the wear, Interface only has to install a fifth as much carpet to provide the same service. Earlier this

year, the company began redesigning its processes along biological lines—the second principle—with a new product, Solenium, the first carpeting that truly closes the loop by becoming the raw material for new carpet. Combined with the Evergreen Lease, Solenium cuts materials and energy use by 97 percent—that's more than a thirtyfold increase in resource productivity.

Isn't such a commitment to sustainability costly? Nope. In the first four years of following these practices, Interface more than doubled its revenues, nearly doubled employment, and tripled profits. It increased revenues by \$250 million just by mining internal waste.

How'd it happen? CEO Ray Anderson read Paul Hawken's last book, and committed his company to change. Still think the big guys have to be the bad guys? Personally, I'd rather show them how to be good guys, and let the Coast Guard get back to more important duties.



### PERSPECTIVES

## PRACTICE MAKES PERFECT

### *Putting Natural Capitalism's Principles to Work*

*Natural Capitalism* is full of ideas and inspiration, but many people want more personalized coaching. That's why RMI has created a new service to help companies and communities put the principles of natural capitalism to work.

In a way, this is nothing new. A self-styled "think and do tank," RMI has always complemented its research with corporate and institutional consulting—which, incidentally, also earns income to support further research. The difference is that the release of *Natural Capitalism* opens a window of opportunity to speak to many more organizations and make a greater difference.

In concert with its strategic restructuring (see [page 11](#)), the Institute is unifying its consulting teams into a single Natural

Capitalism Practice. Clients will still have access to specialized RMI services, but the unified team will provide more comprehensive, cross-disciplinary solutions. For example, a client that contacts RMI for advice on greening a new facility might find that the "Nat Cap" team can also help it redesign its manufacturing process to make the facility even more efficient, and redefine its relationship with its stakeholders (e.g., suppliers and customers) and its host community to realize still other benefits.

In the past three months three new senior staff members have joined this effort: Christopher Juniper, Managing Director of the Natural Capitalism Practice; and Karl R. Rábago and Thomas Feiler, Managing Directors of the practice's

corporate component. Experienced transportation and industrial engineering consultants are expected to come aboard in the coming months.

The practice won't be limited by in-house capabilities: Feiler and Rábago are expanding the Institute's worldwide network of contractors at the leading edge of their fields to round out the team as needed. RMI is also exploring strategic partnerships with business consulting firms in order to provide maximum leverage of its unique expertise.

For more information on the Natural Capitalism Practice, visit [www.naturalcapitalism.org](http://www.naturalcapitalism.org) and click on the "Consulting" button.

### SEMINARS

On a related note, RMI researchers are developing a series of regional seminars and multimedia tools to help participants apply natural capitalism in their companies and communities. Grants from two foundations are supporting work to gain more on-the-ground experience and to experiment with different presentation formats, target groups, and geographical areas.

In Pittsburgh, staff organized two full-day sessions and an executives' breakfast briefing as part of a long-term effort, sponsored by the Heinz Endowments and in cooperation with local partners Sustainable Pittsburgh and the Pittsburgh Technology Council, to help make that city a sustainability showcase (see the fall/winter 1998 newsletter). The second seminar, in October, attracted more than 90 business and community leaders.

Meanwhile, with funding from the Joyce Foundation, RMI staff have begun working with the Western Michigan Sustainable Business Forum, and will help member businesses explore the competitive advantages of natural capitalism at the group's annual meeting in November. The next step is to direct implementation work with up to a half-dozen firms willing to serve as natural capitalism test cases.

—DAVE REED &  
CHRISTOPHER JUNIPER

### *Planting a "Big Idea"*



James Ritchie, courtesy of Joan Klar

*RMI's Amory and Hunter Lovins speaking with President Clinton at an August fundraiser in Aspen. The President accepted a copy of *Natural Capitalism*, and has since taken to referring to the book's thesis in speeches (see [page 3](#)).*

## GREEN DEVELOPMENT

## THE GREEN DREAM FACTORY

### *Lucas Goes Over to the Park Side*

Security was tight the day RMI's Bill Browning and Huston Eubank went out to Skywalker Ranch last January. *Star Wars: The Phantom Menace* was still in post-production, and any number of rabid fans would have braved a squad of Imperial Storm Troopers to sneak a peek.

Browning and Eubank were visiting the special-effects Mecca to meet with Letterman Digital Arts, a company formed by George Lucas to develop a new high-tech headquarters for his companies within San Francisco's historic Presidio. RMI's Green Development Services had been brought on board to incorporate sustainable design into the plan.

Lucas himself attended the meeting—considering the timing, a strong indication of the importance he attached to the project. Appropriately, a film crew was on hand to record the proceedings.

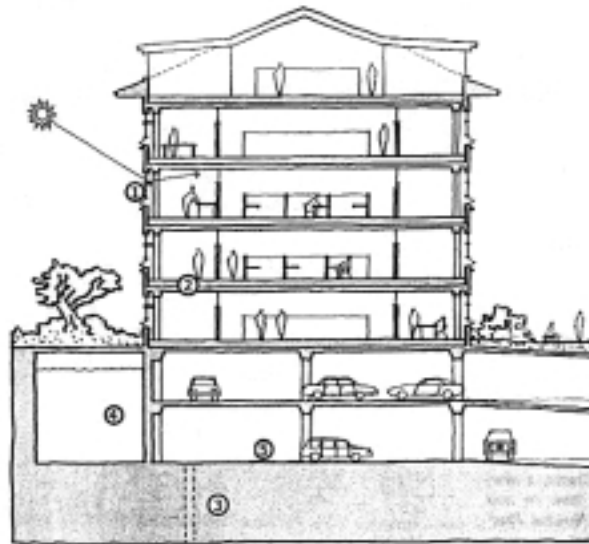
#### THE FORCE WAS WITH THEM

The team's first task was to win the right to build on the site. An Army base since the mid-1800s, the 1,800-acre Presidio was designated as the nation's first urban national park in 1996. To cover its costs, as required by Congress, six parcels would be leased for commercial development. Lucas's team was vying with 16 others for the 23-acre site of the old Letterman Hospital, within sight of the Golden Gate Bridge.

The Presidio Trust had set sustainability as one of three major criteria by which all proposals would be judged. Green Development Services, which had participated in the original Presidio planning process,

found itself assisting with both the semifinals' bids. But Lucas was the more serious about creating a truly green development, says Browning, who was one of three people tapped to make Lucas's presentation to the Trust.

The Force was with the Lucas team; it



Letterman Digital Arts

*Green features: 1) light shelves promote deep daylighting; 2) raised floor allows for displacement ventilation; 3) ground-source heat sink reduces need for artificial chillers; 4) old hospital foundation is retained for rainwater storage; 5) underground parking. (Not shown: public transportation and ridesharing programs.)*

was chosen for exclusive negotiations on the lease in June. By the time you read this, detailed design work should just be getting under way.

#### PASSION AND MONEY

All architects dream of that client with deep pockets and impeccable taste. Green architects dream of a client with those qualities plus imagination, an open mind,

and a healthy respect for the environment.

Lucas's Letterman Digital Arts "is one of the most fun clients we've ever worked with," says Browning. "They're committed and passionate about the environment and employees' quality of life, and extremely creative. They're cost-conscious, of course, but they're an incredibly well-capitalized company, so if it makes sense and it's the right thing to do, they'll say let's do it."

The Letterman Digital Center combines just about everything in the green development cookbook, from energy-efficient construction to low-impact stormwater management. And at nearly a million square feet, with one of the world's most famous corporate tenants, it promises to be an excellent showcase for the power of green thinking.

One of the plan's most remarkable features is that nearly all the center's 1,500 parking spaces will be underground, a decision that for almost any other company would be impossibly extravagant. This makes it possible to create a large public green space, which no doubt appealed to the Presidio Trust. But what's even more impressive, from a green development perspective, isn't how many parking spaces will be placed underground, but how few—only enough for about two-thirds of the 2,500 employees. It's rare that a major employer is willing to buck parking rules of thumb (typically a one-to-one ratio), but the Letterman plan counts on extensive public transportation, ridesharing programs, and nearby employee housing to cut down on single-car commutes. (The Lucas companies together already operate one of the best employee traffic-management programs in the Bay Area.)

As for the buildings, their thin cross-sections and internal courtyards—consciously echoing the historic Presidio style—will maximize daylighting and natural ventilation. An ingenious cooling system using raised floors (see [page 8](#)), combined with San Francisco's mild climate, minimizes the

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need for mechanical systems and the energy they consume—a major achievement for such a large, computer-intensive office complex.

### BYE-BYE HOLLYWOOD

The Letterman Digital Center will provide office space for Industrial Light & Magic and four other Lucas companies. It won't be your traditional Hollywood production facility: except for one soundstage, almost all the indoor space will be configured for animation workstations, drafting, and model making.

Competition for skilled employees is fierce in the digital arts industry, so a big part of the design strategy is to make the center as cushy as possible for them. Among other things, that means ensuring high indoor air quality and providing comprehensive individual control over light levels and ventilation.

In community meetings, some citizens have questioned why Lucas's proposal was chosen over others that featured more rustic activities such as organic agriculture and solar aquaculture. Without second-guessing the Presidio Trust's thinking, it's worth noting that the Letterman Digital Center demonstrates sustainability techniques that are more widely applicable to industry, and therefore have a greater potential for reversing environmental harm. In fact, it might not be too much of a stretch to say that companies like Industrial Light & Magic are putting the first principle of natural capitalism (see [cover story](#)) into practice: they're radically increasing the resource productivity of moviemaking by replacing huge, disposable sets with miniature models and recyclable electrons.

Now if we could only start influencing what's portrayed on screen. Memo to GL: Is there any way to incorporate passive solar design into those Death Stars? How about having the Jedi knights upgrade to compact fluorescent lightsabers? Okay, so the story took place long ago and far, far away, but we don't want it to start looking dated, do we?

—DAVE REED

## BUILDING A BETTER WORKPLACE

### *A Green Twist Turns Office Buildings Upside Down*

Big office buildings are typically designed by a process that could be called "infectious repetitis." Energy engineer Eng Lock Lee describes how it works:

1. Take previous set of drawings
2. Change the box that indicates the name of the project
3. Submit drawings to client
4. Building is constructed
5. Client gripes about discomfort
6. Wait for client to stop griping
7. Repeat process

Not exactly a formula for innovation. Yet while office building design has remained all but stagnant for years, what goes on inside certainly hasn't. Workers using computers require different lighting from those using typewriters or pencils. Photocopiers and faxes change the thermal nature of a space and affect indoor air quality. These and many other types of office equipment increase electricity demand. Even the way people sit is different.

RMI's Green Development Services has

helped design dozens of innovative office buildings that address these issues while saving resources and money. Now a new prototype project offers the chance to move its ideas into the mainstream.

The "modern building prototype" is an initiative of commercial real estate giant Hines, along with a team of consultants from Green Development Services, engineering firm Flack & Kurtz, and Gensler Architects. Two years in development and still evolving, the prototype is a design concept that can be tailored to the specific needs of different clients and locations.

Naturally, the prototype employs standard green techniques such as high insulation, superwindows, daylighting, and efficient lighting and mechanicals. And as in other good green designs, it integrates these elements in a way that produces the best performance—environmental and otherwise—for the buck.

But there's a new twist. Instead of putting the air ducts in the ceiling and

### *RMI in Japan*



Noboyuki Kuritani

*RMI senior research associate Chris Lotspeich presents a Japanese-language copy of Factor Four (the forerunner of Natural Capitalism) to Muneo Suzuki, Deputy Chief Cabinet Secretary for Prime Minister Keizo Obuchi. Invited to Japan by the Osaka Jaycees to speak on environmentally friendly business, Chris also presented a translation of RMI's "Climate: Making Sense and Making Money" to the Emperor and Empress.*



forcing heated or cooled air downward to mix with the air already in the room, the prototype concept is to channel fresh air under a raised floor and let it seep *upward*. That might sound like a minor technical distinction, but it turns out that such a system is easier to install and maintain, saves energy, allows for better and easier rearrangement of office lighting, and produces better comfort and indoor air quality.

And here's the kicker: separating the air distribution from the wiring for overhead lighting, while switching from a steel-and-concrete to an all-concrete structure, saves a foot or more of vertical space per floor—enough to fit in six stories instead of the usual five before triggering expensive high-rise code regulations. That's worth big bucks to developers. (The extra floor can also promote better land use by making infill developments more economical.)

More than just a design concept, the prototype also incorporates a proprietary decision-making process that cuts several months off project timelines—producing groundbreaking savings *before* groundbreaking.

Big deal, says the “just do it” crowd—prototypes are a dime a dozen. But this is different. The team is already testing elements of the prototype in five new buildings in a suburban office park, and Hines hopes eventually to make the process standard procedure. That latter thought packs a wallop, since Hines is one of the world's biggest names in commercial development.

Clearly, when developers say they want to be on the cutting edge of environmentally responsible building design, it's not all altruism. They realize that as green buildings catch on, customers' expectations will rise. Buildings that cost more to run and make their occupants feel worse will simply stand empty.

That future may not be far off, and it's easy to imagine the newspaper ads that would result: *For sale: new office building. Energy hog, unpleasant interior space. Will sell for below market value, or B/O.* Flip to the obituary section, and there's a related note: *Old-school developer dies. Autopsy suggests victim suffered from infectious repetitis.*

—AUDEN SCHENDLER & DAVE REED

## GDS WINS NATIONAL AWARD

RMI's Green Development Services chalked up another honor in April when it received a National Award for Sustainability in the Green Buildings/Real Estate Development category.

The President's Council on Sustainable Development and the national environmental nonprofit Renew America presented the prestigious awards on Earth Day to GDS and 23 other organizations that demonstrate leadership and excellence in integrating environmental, economic, and community sustainability.

“These awards celebrate the ways in which Americans are working together to

protect public health and the environment and to demonstrate that a healthy environment and a growing economy really do go hand in hand,” lauded Carol Browner, Administrator of the U.S. Environmental Protection Agency.

The winners were selected from among more than 300 applicants by representatives of the National Awards Council for Environmental Sustainability and the President's Council on Sustainable Development.

### TRANSPORTATION

## HYPERCAR, INC. HITS THE ROAD

### *If You Can't Beat 'Em, Join 'Em*

Readers interested in efficient vehicles might have noticed that RMI's Hypercar Center<sup>SM</sup> has gone relatively quiet in the past year and a half. Actually, the team has been busier than ever—they just couldn't talk about what they were up to.

Until now.

Since 1994, the Center's role has been to build industry acceptance for the Hypercar<sup>TM</sup> concept that RMI first proposed in 1991—a combination of an ultra-light, ultra-low-drag autobody with hybrid-electric drive and other features that produce radically better fuel economy. Initially, the Center's nonprofit status ideally positioned it to get the Hypercar concept in play: instead of patenting and auctioning the intellectual property and hoping the buyer wouldn't sit on it, the Center was able to put most of it into the public domain to get everyone fighting over it.

The strategy paid off. By early 1998, most automakers were known to be devel-

oping cars that embodied at least some Hypercar principles, and the pace of change was accelerating. But compromises were still diluting the concept's full potential, and meanwhile, the more serious companies got about Hypercar-like designs, the more secretive and less accessible they became. It was clear that the Hypercar Center could no longer best influence the industry as an outsider. It was time to exert direct competitive pressure.

So began the long, strange trip of Hypercar, Inc. (HCI), a for-profit venture that spun off from RMI this past summer.

Like most startups, this one proceeded along a circuitous and often bumpy path. Hypercar, Inc. was formally incorporated in July 1998, but it took more than a year for the company to reach escape velocity from RMI. The startup team—initially comprising five Hypercar Center researchers—recruited management with strong business, financial, and technical expertise,

*(continued on next page)*

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and spent late 1998 and the first half of 1999 developing a business plan and seeking venture capital.

A lead investment from VTZ, a Swiss investment fund that specializes in green technologies (motto: "Green Money for the Blue Planet"), enabled HCI to set up its own office and begin formal operations in August. As of presstime, the venture had raised 80 percent of the \$4 million needed for its start-up phase, and had seven employees.

HCI can't say much about its business plan, except that the company is focused on developing and applying new technology and business models to the automotive industry based on the Hypercar concept. According to Jonathan Fox-Rubin, vice president for business development, HCI is working with Lotus Engineering (the engineering relative of the British sports car company) to produce a "technology

demonstration vehicle," and is examining potential markets such as the "lifestyle market of Generation X and Generation Y customers."

Hypercar, Inc. will no doubt face many challenges as it makes its way in the corpo-

ration that it spun off in 1992, has proved a successful precedent both financially and strategically (see page 11). The Institute also helped ex-staff found two other companies, one of which, efficient-lighting consultancy Rising Sun Enterprises, is still



rate world, but the spinoff is a one-way bet for RMI. The Institute's investment was almost entirely in the form of intellectual capital and intellectual property. In return, RMI owns nearly half of Hypercar, Inc.'s stock, which if successful will generate a new stream of unrestricted income to support further cutting-edge work.

This isn't the first time RMI has launched a for-profit venture. E SOURCE, the electric-efficiency information service

going strong.

The Hypercar Center remains at RMI, but with minimal funding and only one part-time staff member. The Institute is currently seeking funding to carry out further transportation research.

—DAVE REED

*Note: to make room in cyberspace for Hypercar, Inc., the Hypercar Center's web address has changed to [www.hypercarcenter.org](http://www.hypercarcenter.org).*

## WATER

### NIGHT OF THE LIVING DAM

#### *Driving Another Stake into an Unnecessary Project*

Even in these environmentally sensitive times, a bad dam proposal is harder to kill than a horde of zombies.

Consider the King William Reservoir in eastern Virginia, which the Newport News Waterworks first proposed in 1990. A number of regional organizations have consistently opposed the project on ecological and environmental-justice grounds, charging that it will flood more than 400 acres of federally protected wetlands, lower water levels on two rivers, and harm the Mattaponi Indian tribe's historic shad fishery. (The U.S. Fish and Wildlife Service and

the U.S. Environmental Protection Agency have voiced similar concerns.)

In 1997, during the public comment period on the final environmental impact statement, RMI introduced a compelling new argument. At the invitation of the Southern Environmental Law Center, water researcher Scott Chaplin reviewed the proposal and found (as is often the case with proposed dams) that the utility had overestimated future demand and underestimated the potential to reduce demand with much cheaper efficiency measures.

The Army Corps of Engineers, which

issues one of the two required permits, commissioned two independent studies to analyze the utility's assumptions. Both corroborated Chaplin's conclusions.

And on 4 June of this year, in an unprecedented move, the Corps itself agreed. In issuing a preliminary decision to deny the permit request, the Corps' Norfolk District found that the reservoir wasn't necessary because the utility had overestimated Newport News' future water needs by a factor of two, and because the reservoir's environmental and social impacts were too severe.

End of story? Alas, no. Four days later, Virginia Governor James Gilmore appealed the decision at the city's request, kicking it up to the Corps' North Atlantic Division, where it now rests.

It sounds like a never-ending saga, but here's the good news: as hard as it is to kill unnecessary dams, it's getting even harder to *build* them.

## RMI NEWS

## ALL CHANGE

*RMI Embarks on a Major Strategic Planning Process*

You know how it is. You're going along your merry nonprofit way, a new project here, a couple of extra staff there, and one day you look in the mirror and realize you're a multimillion-dollar organization with nearly 50 employees.

Well okay, it didn't come out of the blue just like that, but RMI's 17-year growth has prompted a good deal of internal introspection in the past few years. Is our mission still on target? What's our proper size? Do we need to restructure? Where should our funding come from? Last October, the Institute's management and Board of Directors moved to settle these questions by initiating a formal strategic planning process to be led by outside consultants.

At the same time, they agreed to a management-level reorganization to be phased in over six months. In April of this year, Marty Pickett—previously RMI's Vice President for Organizational Affairs and Special Projects—was appointed Executive Director, with responsibility for all the Institute's day-to-day functions. Former Executive Director Hunter Lovins and Research Director Amory Lovins were made co-CEOs with responsibility for strategy and research respectively.

**BLOWING OUT THE COBWES**

Though still in process, the strategic planning is going exceedingly well. In many ways it's confirmed what we already felt we needed to do, but it's also blown out the cobwebs and inspired plenty of institutional creativity.

In July, after several months of fundamental probing, management consultants Lynne Yeannakis and Libby Dietrich helped us arrive at a surprising—or perhaps not so surprising—consensus about RMI's future. Everyone agreed the Institute had outgrown the old “mom and pop” organizational model, which was too heavily cen-

tralized around founders Amory and Hunter Lovins and too reliant on Amory as the chief idea generator. The vision that emerged was of a more mature, broader-based organization, though not necessarily a bigger one; an Institute that places greater emphasis on recruiting experienced team leaders and fostering original thinking, and that remains flexible and diversified by subcontracting work to a network of “virtual” staff; and a strategic shift of emphasis from education to applied research. (The latter dovetails with the new Natural Capitalism Practice—see [page 6](#)).

This October, the Board, staff, and consultants added flesh to the vision, thinking through staffing and resource-allocation issues, finalizing RMI's first bottom-up annual budget, and refining organizational charts. The latter task was good for a few laughs: various versions were labeled “the

ameba,” “the dog bone,” and “the double-yolked egg.” (It's never been easy to fit RMI into standard molds.)

**EVOLUTION**

The whole process is more evolution than revolution, says Pickett: the goal is to build on RMI's strengths, not throw the baby out with the bathwater. For example, she notes, “one of the great things about RMI is that it has been opportunistic—when a new cutting-edge issue comes up, RMI has been able to react quickly and run with it. But we need to make sure that's balanced with some long-range vision of the kind of institute we want to be.”

Unfortunately, the strategic planning process has imposed an unexpected financial burden on the Institute, as several foundations have apparently delayed major grant renewals until the plan's completion. This is expected to result in a substantial operating deficit for 1999—our first in five years. But we see this as a long-term investment to ensure that RMI remains lean, effective, and on the cutting edge of innovation.

—DAVE REED

## SO LONG, E SOURCE

Back in 1986, when RMI was young and focused mainly on trying to reform the electric-utility industry, the lack of up-to-date technical information on efficient technologies was stifling progress. Since nobody else was doing it, RMI stepped up to the plate and formed COMPETITEK, an in-house information service aimed at utilities and large energy users.

COMPETITEK was so successful that by 1992 it was straining at its leash, and RMI decided to spin the unit off as a for-profit subsidiary, capitalized by a program-related investment by the John D. and Catherine T. MacArthur Foundation and private investors. The new company moved to Boulder, Colorado, and renamed itself E SOURCE.

In an innovative arrangement that has

served as a model for enterprise in the nonprofit world, RMI owned all of E SOURCE's voting common stock and received royalties based on the subsidiary's revenues. It was a fruitful relationship that enabled E SOURCE to expand rapidly, furthered RMI's mission in the private sector, and provided unrestricted funds to support the Institute's public-interest work.

But by late 1998, it was time for RMI to let its most successful spinoff go. Having grown bigger than its parent (\$7 million in annual revenues, 58 employees), E SOURCE needed access to more capital to reach broader markets, and the Institute saw an opportunity to gain greater financial security.

This past June, RMI sold its E SOURCE stock to Pearson PLC, a UK-based compa-

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ny that owns such brands as Simon & Schuster Publishing, Penguin Books, and *The Financial Times*. The sale resulted in a cash payment to RMI that will produce an income stream roughly equal to the expected payments from E SOURCE.

"E SOURCE has been an important source of revenue for RMI," says RMI co-CEO Hunter Lovins. "More important, the company has done a better job than we could of providing information to the private sector about the profitability of using energy efficiently."

RMI is proud to have founded and fostered the success of E SOURCE, and wish it success in the big wide world beyond the nest.

#### RMI Shipping & Handling Charges

Order Amount	U.S.	Canada
\$ 0.00–12.00	\$3.50	\$4.50
12.01–20.00	4.50	5.50
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50.01–100.00	8.50	10.25

We normally ship by first-class mail or UPS. For larger orders, express delivery, or shipments outside North America, please call RMI. Shipping charges may be higher for multiple books, so again, please call. All charges are in U.S. currency.

## NEW PUBLICATIONS

The following new publications can be ordered from RMI, either by phone (970/927-3851) or online ([www.rmi.org](http://www.rmi.org)):

### NATURAL CAPITALISM

***Natural Capitalism: Creating the Next Industrial Revolution***, Paul Hawken, Amory Lovins, and Hunter Lovins. See cover story. Hardback, 416 pages, \$26.95. (NC99-13)

#### "A Roadmap for Natural Capitalism,"

Amory Lovins, Hunter Lovins, and Paul Hawken. A readable summary of the book's basic business case reprinted from the May-June *Harvard Business Review* (the piece will also appear in the upcoming anthology *Harvard Business Review on Business and the Environment*). 16 pages, \$4. (NC99-8)

### ENERGY

**"Energy Surprises for the 21st Century,"** Amory Lovins and Chris Lotspeich. A good summary of RMI's perspective on energy trends. 8 pages, \$2.50. (E99-16)

### BIOTECHNOLOGY

**"A Tale of Two Botanies,"** Amory and Hunter Lovins. Uncut version of an op-ed

piece in the *St. Louis Post-Dispatch* comparing transgenic crops to nuclear power. 2 pages, \$2. (B99-11)

### TRANSPORTATION

**"Uncommon Knowledge: Automotive Platform Sharing's Potential Impact on Advanced Technologies,"** Michael Brylawski. Technical paper presented at the International Society for the Advancement of Material and Process Engineering's September 1999 conference. 18 pages, \$5. (T99-10)

### FORESTRY

**"Saving Forests from the Demand Side,"** Amory Lovins. Printouts of an overhead presentation to the World Resources Institute. 12 pages, \$5. (F99-14)

### WATER

**"Re-evaluating Stormwater: The Nine Mile Run Model for Restorative Development,"** Richard Pinkham, Bruce Ferguson, and Timothy Collins. Full-color report on low-cost measures that can reduce sewer overflows, restore urban watersheds, and revitalize communities (see "Rain, Rain, Go Away," fall/winter 1998 newsletter). Wirebound, 32 pages, \$24.95. (W99-15)

Please note that our price for *Green Development: Integrating Ecology and Real Estate* is now \$60.00, due to a price increase by the publisher. If you're interested in the book you'd do well to act fast, because we've been informed that the price of the next shipment's books will be \$70.

## ANNUAL REPORT

RMI's 1998 annual report is now available—late, but worth the wait. Completely redesigned and now in full color, the report summarizes an eventful, transitional year in the life of the Institute. If you would like a free copy, please contact Karl Claus at 970/927-3128 or [kclaus@rmi.org](mailto:kclaus@rmi.org).

### New Staff



Norm Clasen

Welcome aboard to gardener Paul Buch, web coordinator Bill Simon, executive assistant Marilyn Wien, and Natural Capitalism Practice managing director Christopher Juniper. (Not pictured: Karl Rábago and Tom Feiler.) Hasta la vista to departing staff Mardell Burkholder, Judy Moffatt, José Gomez, the whole Hypercar crew (Mike Brylawski, David Cramer, Jonathan Fox-Rubin, Timothy Moore, and David Taggart), and interns Chad Laurent, Ken Ritsher, and Jennifer Schwager.



# 1998 FINANCIAL RECAP

## *A Record-Breaking Year for RMI*

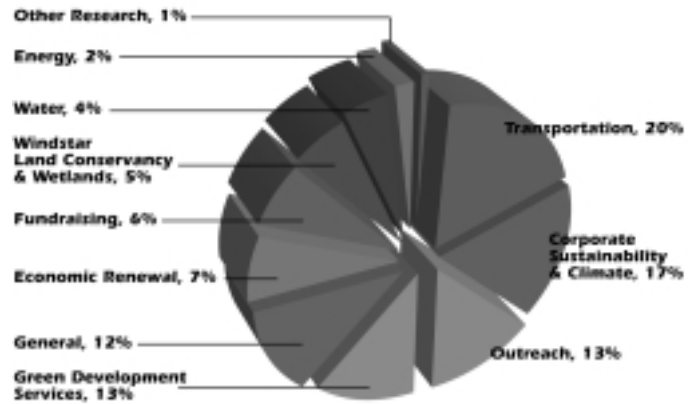
RMI made welcome strides toward its goal of increased financial self-reliance and stability in 1998.

The Institute achieved its fourth annual operating surplus in a row (its biggest ever), greatly increased its proportion of earned income, strengthened its development staff, and expanded credit to stabilize cashflow.

Here are fiscal highlights of the year, based on audited financials (excluding the Windstar capital campaign):

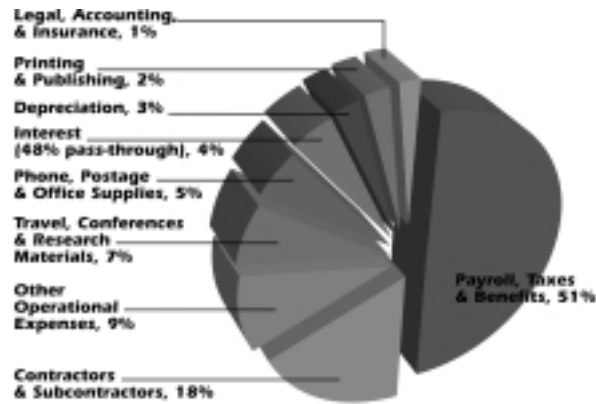
- Net operating income was \$545,000, exceeding the target by \$365,000, or 202 percent.
- Operating expenses—68 percent for people—rose by 41 percent, from \$2.53 million to \$3.56 million (due mainly to a one-time transportation design workshop).
- Total accrued revenues rose by 39.3 percent to \$4.11 million, surpassing the increase in expenses by \$129,000.
- Program areas accounted for 81.6 percent of expenses, fundraising 6.2 percent, and management and administration 12.1 percent.
- Earned income was 48 percent of total revenue, up from 33 percent in 1997. This was attributable to increased implementation advisory services (notably the transportation design workshop) and E SOURCE royalties.
- Foundation grants provided 41 percent of revenue in 1998, down from 49 percent in 1997, due mainly to the higher earned-income percentage. Individual and corporate contributions increased by 19 percent, or \$60,000.
- Total assets rose from \$5.06 million to \$5.50 million; net worth, from \$1.57 million to \$2.43 million. Most of this surplus was used for capital improvements and to repay loans.
- A program-related investment from a long-time donor secured for RMI a \$100,000 line of credit, representing a nearly two-week operating safety net. (Not nearly enough, but a lot better than zero!)
- The Development department grew from two to four full-time-equivalent employees, improving grant-writing and planned-giving capabilities.

### EXPENDITURES BY PROGRAM



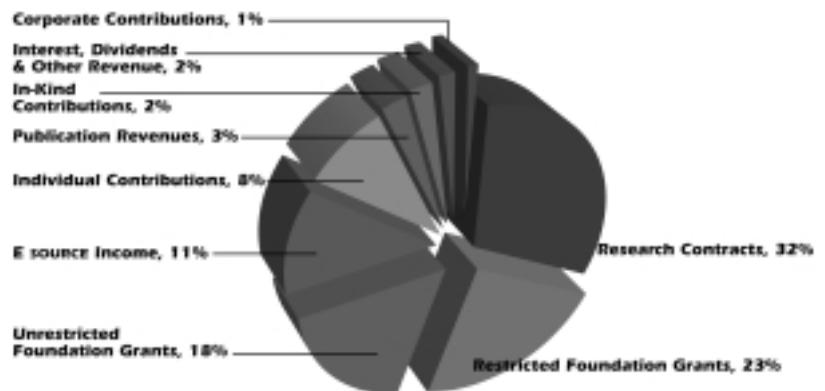
Total Expenditures by Program: \$3,564,284

### EXPENDITURES BY CATEGORY



Total Expenditures by Category: \$3,564,284

### SOURCES OF REVENUE



Total Sources of Revenue: \$4,109,522

## STOCK GIFTS: LEAST-COST GIVING

Has the value of your investment portfolio grown lately? Facing some big capital gains come April 15?

Consider making a gift of stock to Rocky Mountain Institute. Giving appreciated securities is better than giving cash because you get the tax deduction on the donation at its appreciated value *without* paying capital gains tax on the appreciation. You'll be providing the same level of support to RMI, but at less cost to you.

For example, suppose the shares you bought in XYZ Corp. for \$500 now have a market value of \$6,000. If you donate them to RMI, you not only can offset the \$6,000 donation against income, you'll also avoid the tax on the \$5,500 capital gain. (That's why it's better to transfer the stock to RMI rather than selling it and giving RMI the money.)

This program isn't just for the well-endowed. Since the beginning of 1998, RMI has received stock gifts ranging from \$150 to more than \$30,000. And just in case you were wondering, RMI immediately liquidates donated stock—we're not in the business of speculating on the stock market—and doesn't have to pay tax on the cash raised from its sale.

Think of your gift to Rocky Mountain Institute as a savvy investment in natural capital—one that yields dividends on a global scale!

If you have questions or would like more information on making a gift of securities, please contact Karl Clauss, RMI Development Coordinator, at (970) 927-3128 or [kclauss@rmi.org](mailto:kclauss@rmi.org).

## ECO-ESSAYS: R.I.P.

It was a noble attempt, but RMI's involvement in the ECO-Essays radio series, announced in the last newsletter, has been suspended for lack of funding.

With a grant from the ARIA Found-

*(continued on page 16)*

## INSTITUTE SUPPORTERS

Our sincere appreciation is offered to these friends who have contributed to RMI. Please let us know if your name has been omitted or misspelled so it can be corrected in the next issue. Donations received between 1 January and 31 August 1999 are listed. Numbers in parentheses indicate multiple donations.

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(continued on next page)

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### LETTERS TO THE EDITOR

We want to hear your comments, crit-  
 icism, or praise relating to any article  
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 all correspondence to:

Dave Reed

Newsletter Editor

Rocky Mountain Institute  
 1739 Snowmass Creek Road  
 Snowmass, CO 81654-9199

tel: (970) 927-3851

fax: (970) 927-3420

email: dreed@rmi.org

web: www.rmi.org

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Rocky Mountain Institute is an inde-  
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Seeking ideas that transcend ideology,  
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# ECO-ESSAYS

*(continued from page 14)*

ation, RMI teamed up with producer Peter Johnson earlier this year to create three months' worth of daily three-minute radio essays encouraging "environmental awareness and responsibility." The lively spots covered everything from green buildings to green power, and from biotech to biodiversity.

By the time the funding ran out, the series was reaching 7 million listeners worldwide through National Public Radio and the Armed Forces Radio Network. Indeed, many stations are still rerunning ECO-Essays.

Our sincere thanks go out to readers who donated money to "adopt" ECO-Essays, and especially to AES Corporation and The Watt Stopper, whose gifts enabled us to contribute six of the essays in the final installment in August.

*(continued from page 15)*

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