



RMI Solutions

NEWSLETTER

Checkmate, Oil Dependence

THE FINAL MOVE IS ON THE WAY

Winning the *Oil Endgame* offers a coherent strategy for ending oil dependence, starting with the United States but applicable worldwide. There are many analyses of the oil problem. This synthesis is the first roadmap of the oil solution—one led by business for profit, not

dictated by government for reasons of ideology. This roadmap is independent, peer-reviewed, written for business and military leaders, and co-funded by the Pentagon. It combines innovative technologies and new business models

Winning the Oil Endgame will be officially released on 20 September.

Here, we present the executive summary. For more information, please visit www.oilendgame.org.

with uncommon public policies: market-oriented without taxes, innovation-driven without mandates, not dependent on major (if any) national legislation, and designed to support, not distort, business logic.

Two centuries ago, the first industrial revolution made people a hundred times more productive, harnessed fossil energy for transport and production, and nurtured the young U.S. economy. Then, over the past 145 years, the Age of Oil brought unprecedented mobility, globe-spanning military power, and amazing synthetic products.

But at what cost? Oil, which created the sinews of our strength, is now

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The cover art stylizes the thirteenth game of the 1972 world title match between Bobby Fischer (USA) and Boris Spassky (USSR). It shows the endgame position after 61.

Illustration: Ian Naylor, www.aircrew.co.uk

Briefing the Homeowner. The Institute and Stonyfield Farm update RMI's popular Home Energy Briefs (p. 3).

Antipodean Adventures. RMI's Huston Eubank, AIA, heads south for a little sightseeing, a little mingling, and a lot of work, spreading the word about green building (p. 6).

What Are You Doing? Our summer interns explain what they're up to (p. 9).

Staff Spotlight. RMI's Odd-Even Bustnes describes his upbringing, his resume, and his refusal to specialize (p. 10).

Other Voices. Rod Ingersoll recounts Newcastle, Australia's switch to biofuels and why these guys (at right) are jumping for joy (p. 13).

Board Spotlight. RMI Board member Ray Anderson didn't start out green. Now he's revered for his commitment to sustainability. Read why (p. 15).

Donor Spotlight. Richard Ford of Memphis likes to explore new worlds, new ideas, and new technologies that could help save water, people, and the planet. Here he tells us about them (p. 16).



What's Inside...

Winning the Oil Endgame

Advanced composite or lightweight-steel materials can nearly double the efficiency of today's popular hybrid-electric cars and light trucks while improving safety and performance.

becoming an even greater source of weakness: its volatile price erodes prosperity; its vulnerabilities undermine security; its emissions destabilize climate. Moreover the quest to attain oil creates dangerous new rivalries and tarnishes America's moral standing. All these costs are rising. And their root causes—most of all, inefficient cars and light trucks—also threaten the competitiveness of U.S. automaking and other key industrial sectors.

The cornerstone of the next industrial revolution is therefore winning the Oil Endgame. And surprisingly, it will cost less to displace all of the oil that the United States now uses than it will cost to buy that oil. Oil's current market price leaves out its true costs to

the economy, national security, and the environment. But even without including these now "externalized" costs, it would still be profitable to displace oil completely over the next few decades. In fact, by 2025, the annual economic benefit of that displacement would be \$133 billion gross (or \$70 billion net of the displacement's costs). To achieve this does not require a revolution, but merely consolidating and accelerating trends already in place: the amount of oil the economy uses for each dollar of GDP produced, and the fuel efficiency of light vehicles would need only to improve about three-fifths as quickly as they did in response to previous oil shocks.

Saving half the oil America uses, and substituting cheaper alternatives for the other half, requires four integrated steps:

- **Double the efficiency of using oil.** The United States today wrings twice as much work from each barrel of oil as it did in 1975; with the latest

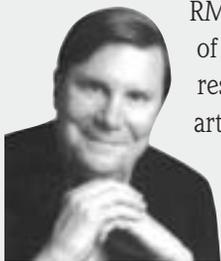
proven technologies, it can double oil efficiency all over again. The investments needed to save each barrel of oil cost only \$12 (in 2000 \$), less than half the officially forecast \$26 price of that barrel in the world oil market. The most important enabling technology is ultralight vehicle design. Advanced composite or lightweight-steel materials can nearly double the efficiency of today's popular hybrid-electric cars and light trucks while improving safety and performance. The vehicle's total extra cost is repaid from fuel savings in about three years; the ultralighting is approximately free. Through emerging manufacturing techniques, such vehicles are becoming practical and profitable; the factories are also cheaper and smaller.

- **Apply creative business models and public policies** to speed the profitable adoption of superefficient light vehicles, heavy trucks, and airplanes. Combined with more efficient buildings and factories, these

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RMI *in the news*

Jay Hughes, Jr. Joins RMI's Board



RMI is pleased to announce the recent election of **James E. "Jay" Hughes, Jr.** to the Institute's Board of Directors. A "philosopher of the family and a counselor to families of affinity," Jay is an Aspen, Colo. resident and the author of the book *Family Wealth: Keeping It in the Family*, as well as numerous articles on family governance and wealth preservation.

"It is an honor to join RMI's journey," he said.

Jay was the founder of a law partnership in New York City, Hughes and Whitaker (as well as a partner in several other firms). He frequently facilitates multi-generational family meetings with a special emphasis on mission statements and governance issues, and he has spoken frequently at international and domestic symposia on estate and trust planning.

Jay is also an emeritus member of the Board of The Philanthropic Initiative; a councilor to the Family Office Exchange; an emeritus faculty member of the Institute for Private Investors; a retired member of the Board of the Albert and Mary Lasker Foundation; a senior dean of The Learning Academy and a founder and former member of the Board of The Learning Academy Foundation; and an emeritus board member of New Ventures in Philanthropy. He is also a member of the Circle of Friends of the Institute of Noetic Sciences; a co-chair of the Board of Advisors to the Spiritual Paths Foundation; strategic advisor to the Friendship Bridge Foundation (a micro-credit and education donor in Latin America); on the boards of various private trust companies; an advisor to numerous investment institutions; and a member of the editorial boards of various professional journals.

Flipping Our Lids

STONYFIELD FARM AND RMI BRIEF HOMEOWNERS ON ENERGY EFFICIENCY

By Cameron M. Burns

To the casual supporter, Rocky Mountain Institute's most important activities might appear to be connections with and influence upon high-level people in government and business, from Department of Defense personnel to officers at multi-national corporations. Those connections are, of course, meaningful, but arguably RMI's most important work is informing, guiding, and enthusing the general public about energy and resource efficiency. After all, most of us at RMI are like typical concerned citizens anywhere—i.e., working to change imbalanced business-as-usual resource policies and practices.

So, it's no surprise that RMI's **Home Energy Briefs**—a series of nine practical guides describing what the average homeowner can do to save energy—are among some of the Institute's most influential documents. In fact, last year, with no marketing, the Briefs were downloaded from www.rmi.org an average of 15,000 times apiece. While the Briefs are, for the most part, evergreen documents, technology for the home has advanced since their first publication and some of the numbers have slowly drifted out of currency. Now, with the help of several enthusiastic partners (Stonyfield Farm, the National Association of Realtors, the Durst Organization, and donor Deborah Reich) we are updating them.

Defining "Corporate Activism"

The major supporter of this project, Stonyfield Farm (www.stonyfield.com), has been supporting a diverse group of organizations addressing societal, environmental, and technological challenges



since the company's inception in 1983. Organizations like RMI often talk about corporations in terms of their corporate citizenry—Stonyfield has, arguably, pushed good corporate citizenship a few long strides into the realm of corporate activism.

Surfing through Stonyfield Farm's excellent and colorful website you might think you've stumbled upon the website of a vibrant young environmental group, or that of a graphic artists' coop. That's really no surprise, as Stonyfield Farm's main goal is "to produce the best-tasting, healthiest products possible, and to try to do some good in the world while we're at it."

Stonyfield Farm was founded in 1983 in Wilton, N.H., as something of an experiment. Family farming was on the decline, and the New England

dairy industry was struggling to compete with large-scale factory farming in other areas. Samuel Kaymen, one of the country's leading authorities on organic agriculture, and Gary Hirshberg, an environmental activist, windmill maker, and entrepreneur (and former Executive Director of the New Alchemy Institute), decided to work together to see how successful family farming could be when done right—with product and principles driving the business. They took Kaymen's organic farming school, which was already producing a small amount of yogurt for the students and faculty, and slowly expanded the operation.

The farm was a big success, and by 1989, Kaymen and Hirshberg had outgrown the original facility and moved the "Farm" into a new "Yogurt Works" facility in Londonderry, N.H., where the company and its roughly 230 employees are now located. Today Stonyfield Farm sells about \$120 million worth of yogurt annually, and 10 percent of the profits are donated to organizations like RMI through its "Profits for the Planet" fund.

Like many of the companies you might read about in *Natural Capitalism*, Stonyfield Farm has undertaken a raft of measures designed to reduce energy and resource consumption, and to eliminate toxicity in every aspect of its business operations.

Stonyfield Farm supports sustainable agriculture through its work with organic growers who annually provide the millions of pounds of agricultural products to make its yogurt and

Energy

"RMI provides the science, and we're the link to getting the information out to the consumer."

Gary Hirshberg, CEO, Stonyfield Farm

smoothie products. The firm started making organic products in 1995 and today over 85 percent of sales are of certified organic products.

Stonyfield Farm was also the first U.S. manufacturer to offset 100 percent of the carbon dioxide emissions from its facility's energy use. Since 1997, the company has offset over 20,000 metric tons of greenhouse gases, which is equal to taking 3,500 cars off the road for one year. Stonyfield also wrote and distributed free of charge a "How-to Guide" for businesses that want to offset emissions.

Through Stonyfield Farm's reuse and recycling program, 10 million pounds of waste have been kept out of land-

fills and incinerators and over 6,000 metric tons of carbon dioxide emissions have been avoided. The company has worked with the University of Michigan's Center for Sustainable Systems to use life-cycle assessment to identify ways to reduce the environmental impacts of packaging. For instance, by eliminating the plastic over-cap and switching to a foil lid on six-ounce cups, Stonyfield Farm eliminated the need for 270 tons of plastic annually, which saves enough energy to power over 180 U.S. households for a year.

If that's not enough, Stonyfield Farm uses the lids of its yogurt cups as "billboards" to promote good things and appropriate actions. Messages on over 135 million yogurt lids have increased

awareness on such environmental issues as energy efficiency, global warming, and water pollution, and even alerted consumers to the existence of toothbrushes made from recycled yogurt cups! The Stonyfield Farm monthly "E Moosletter" (<http://ecards.stonyfield.com/subscriptions.cfm>), which goes to over three hundred thousand people, includes articles on all sorts of environmental issues, including sustainable agriculture, organic agriculture, packaging, corporate responsibility, and voting with your dollar.

The high point of Stonyfield Farm's activism is arguably its nutrition and school-level education efforts, dubbed the "Menu for Change: Getting Healthy Foods Into Schools." Stonyfield describes the effort as "a grassroots program that encourages parents and students to demand more

RMI *in the news*

Bill Browning Named RMI Senior Fellow



Bill Browning, founder of Rocky Mountain Institute's Green Development Services, has been named an RMI senior fellow. Browning assumed a part-time status with RMI beginning in July so that he could pursue development of Haymount, Virginia, a "new urbanist" town that he is helping pioneer.

Browning is a partner in the development group Fat Shad, which will design and build Haymount, located on the Rappahannock River just south of Washington DC. All the buildings in Haymount will meet the highest green building standards. The town will include 4,000 homes, 250,000 square feet of retail space, 500,000 square feet of commercial and light industrial space, fourteen church sites, numerous parks, two schools, a college campus, and an organic farm.

"Haymount will incorporate innovative energy, stormwater, and wastewater infrastructure systems," Browning said. "Designing this town presents an opportunity to implement many of the ideas that RMI promotes."

Browning founded RMI's Green Development Services (GDS) group in 1991 and has been involved in the Institute's research and consulting activities since. He first joined RMI in 1987 to work with the Institute's agriculture program, and then joined the economic renewal group. For RMI, Browning has led or supported innovative design efforts for scores of clients, including the Sydney 2000 Olympics, Wal-Mart, the White House, the Pentagon, Hines, and LucasFilm. As a senior fellow, Browning will continue to be involved in GDS's largest research and consulting projects.

"We are excited that Bill now has the opportunity to apply his knowledge and experience at Haymount," said Alexis Karolides, GDS team leader. "Our arrangement with Bill as a senior fellow gives both Bill and RMI the chance to continue applying and learning about green building principles."

nutritious and safer food in schools, where children spend such large portions of their day.”

(Not) Keeping a Lid on Issues

It was Stonyfield Farm’s lid program that prompted a working relationship between the organic yogurt-maker and RMI almost a decade ago when the two organizations produced a lid to help raise funds for the purchase of the Windstar property. More recently, RMI worked with Stonyfield Farm staff to craft poignant factual messages about automobile efficiency and drilling in the Arctic National Wildlife Refuge (old lids are still visible at www.stonyfield.com/EarthActions/LidArchive.cfm) during a campaign to “Wake up Washington.”

“We depend on the expertise of credible experts like those at RMI to generate compelling statistics that we can use to educate our millions of customers on critical issues such as the development of ANWR,” said Nancy Hirshberg, Stonyfield Farm’s vice president of natural resources.

Today, the relationship has blossomed again, and Stonyfield Farm has signed on as an underwriter of a revamping of RMI’s Home Energy Briefs. The original Briefs were written between 1994 and 1997, by various RMI staff

members and freelance writers. This time, the Briefs project is being tackled by RMI’s **Kitty Wang, Ramola Yardi, Sarah Goorskey, and Morley McBride**, as well as former RMIte **Andy Smith**.

Once again the Briefs will delve into topics of interest to every person with a dwelling: home heating and cooling systems, computers and peripheral devices, ovens, dishwashers, lights, washing machines, and other household devices and systems. Written in a simple,

easy-to-understand style, the Briefs will be richly illustrated and sensibly designed.

And, as mentioned, if past experiences are any sign of what’s to come they will likely remain one of the best publications RMI has ever crafted—in 2002, the Brief on washing machines and dryers was downloaded over 20,000 times!

“Residential energy use in the U.S. comprises about 20 percent of the total (behind industry and transportation) and can, as we’ve seen in California, often drive a utility’s sys-

tem peak demand,” said Kitty. “The updated information in the new Home Energy Briefs will show homeowners and renters that there are many simple ways to dramatically reduce energy use without

sacrificing comfort and appeal. And by delivering energy efficiency awareness and solutions through the Home Energy Briefs, there is a distinct possibility that the reader will choose greater productive use of energy in other arenas of their lives—transportation, business, and civic involvement.”

Once the Briefs have been prepared RMI will promote their existence to the Institute’s 1,300 national media contacts and our 3,000 “Ambassadors” (folks who have an interest in RMI’s work).

“RMI provides the science, and we’re the link to getting the information out to the consumer,” said Gary Hirshberg. “The Home Energy Briefs include important information that is not readily available to people. By partnering with RMI, we can work together to disseminate succinct, sound advice on efficiency and outline concrete steps each of us can take to live lighter on the Earth.”

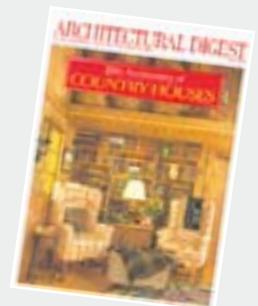


Stonyfield’s 1997 lid, supporting RMI’s purchase of half of the Windstar Conservancy land.

RMI in the news

RMI HQ Gets Space in *Architectural Digest*, *New York Times* magazine

RMI’s 1984 headquarters building was featured in the June ’04 issue of *Architectural Digest* (www.architecturaldigest.com), the roughly 800,000-circulation Condé Nast magazine based in Los Angeles. A two-page article by **Christopher Petkanas** about the headquarters building appeared in the “Environmental Design” section and described the Institute as a leader in green architecture. Also, RMI was mentioned in the *New York Times* magazine 6 June 2004 edition. Columnist **Rob Walker** mentioned RMI in his piece (“Brewed Awakening?”) about Fair Trade coffee.



In a Land Down Under

RMI'S HUSTON EUBANK PUSHES GREEN-BUILDING WORLDLINESS

By Cameron M. Burns

One of the things RMI has long strived for is an international reach to its cross-pollination of earth saving concepts, ideas, and strategies. Huston Eubank, AIA, of RMI's Green Development Services, has long felt that RMI's work on green building especially needs to carry an international flavor.



In 2000, he masterminded a European tour for RMI's Green Development Services. In 2002, he participated in the organizing meeting for the World Green Building Council, and was subsequently appointed its secretary. Since then—and even before—he has been winging his way around the globe, helping various nations establish their own green building councils and rating systems, spreading the green building mantra, and generally acting as a purveyor of good ideas. This summer, he had a chance to focus his efforts, and spent six weeks in Australia, cross-pollinating and working on various green designs.

As many *RMI Solutions* readers already know, Australia is a tad schizophrenic when it comes to sustain-

ability problems and solutions. It leads the world in per capita carbon emissions (because it burns a lot of brown coal), but at the same time its citizenry boasts a thorough knowledge of everything from solar energy to recycling (Australians are, incidentally, among www.rmi.org's top viewers). Green building, though, is one area where Australia is starting to shine.

"I was amazed by the awareness of green issues down under and the level of sophistication in dealing with various building and development issues," Huston said. "Their Green Star system is, I believe, ahead of our LEED system—it's more comprehensive. One of the big problems they have right now is a water shortage, and the water shortage¹ has prompted the building industry to focus on conservation, efficiency, and alternative technologies and design approaches to maximize the water they have. They're using it [the shortage] to inspire some really good design work."

Genesis for the Journey

The trip to the antipodes came from a suggestion by Richard Sebo, business development director at the Royal Melbourne Institute of Technology's (RMIT) School of Architecture's Center for Design. Last year, Sebo suggested Huston apply for the Fulbright Senior Specialist Program, into which he was accepted. This year Sebo suggested he seek funding from the Fulbright program to visit Australia for two weeks to work on green design. As preparations progressed, however, Sebo was able to cobble together a much larger "tour" for Huston outside the Fulbright domain. In addition,

Victoria's Sustainable Energy Authority (SEAV) requested two weeks of Huston's time to support its program. The ultimate result was a seven-week flurry of lecturing, consulting, teaching, and of course, observing.

His activities Down Under could fill this newsletter: SEAV kept Huston "running with [his] tongue out," working on six projects, including a training facility for firefighters, a lab/business incubator for Monash University, a twenty-seven-story office building for downtown Melbourne, a retrofit of another Melbourne office building, and a new headquarters for the innovative Bendigo Bank. For RMIT and the Green Building Council of Australia, Huston lead a one-day workshop on green decision making in three-cities (Adelaide, Melbourne, and Sydney), as well as a half-day workshop for building industry professionals on "diffusion of learning"—in short, a discussion of how green building rating systems could be better devised and utilized; he lead a workshop with the Queensland Environmental Protection Agency; he participated in two meetings to update the Sydney Olympic Park's environmental guidelines (the park is being in-filled with residential and commercial units); and he lectured at Melbourne Town Hall on green building design, drawing roughly 350 members of a curious public—among many other activities.

Individual projects are all well and good, but it was the quickly blossoming Australian approach to green building that impressed Huston.

“The City of Melbourne has an ordinance on the table that would require any commercial facility in the city to achieve a high score on the Green Building Council of Australia’s Green Star rating system. That’s unique in the world,” Huston noted. “In the United States the governments say we’ll make our government buildings green as an example, but in Melbourne they’re saying we’ll make every building green. That’s pretty remarkable.”

Rethinking Integrated Design?

Many experiences in Oz strengthened Huston’s appreciation for and understanding of integrated design. One of the more interesting projects he was introduced to is a new home for the Melbourne city council, called Council House 2 (“CH2”). The project was run by Rob Adams, the council’s director of city projects, who wants the building to be a world-class example of energy and resource efficiency. After negotiating standard, tight contacts with all the project designers, Adams then told them he would pay their hourly rates (in addition to their agreed fees) to work together in a charrette setting “for as long as it took” to produce a workable design.

“He had budgeted four to six weeks but they finished in two and a half weeks,” Huston noted. “Then they went into the construction documents and finished the entire design process in less time than the standard linear design procedure takes.”

The ceiling system for the new building offered a poignant example of why the charrette (or any integrated design process) is valuable, Huston notes. The structural engineer was championing an innovative new design for a concrete ceiling system—which would be a structural component, a light diffuser, a key part of the cooling system,

a sound reducer, etc.—but he didn’t have enough information for the quantity surveyor (cost estimator).

“The QS said, ‘I don’t know how to price this,’” Huston recalls. “The structural engineer then went out and talked to a variety of tradespeople and came back two days later and detailed how it could be done, how much it would cost, and everything else they needed to know to make this creative new design element work cost-effectively.”

In a traditional linear process, the charrette would have ended, and the innovative ceiling solution would’ve been replaced with a standard ceiling system that the contractor understood.

“We [RMI] tend to do hit and run charrettes, in two days or less,” he said. “What I realized from the Melbourne charrette was that two days is not enough to do properly integrated design. Also, that longer charrettes can actually produce final designs at a lower cost than a linear design process with a two-day charrette wedged into the schedule.”

Huston is adamant that the agreements governing traditional design processes must be changed if integrated design is to work.

“It has to be recognized in the contracts as being something different, it has to be funded differently, it really has to be taken seriously if it’s going to work,” he said.

One major area of focus in Australia these days is valuation: estimating and comparing the benefits and savings of green buildings. In the United States, Huston noted, this gets only minor attention, whereas in Australia there’s a concentrated effort to fully understand and measure the attributes of green design. Indeed, Melbourne’s Council House 2 project is expected



Huston hard at work with Victoria’s Sustainable Energy Authority.

to cost more in terms of capital investment, but the project’s proponents are pushing the argument that valuable productivity gains can be realized in a green building.

Size Counts

Perhaps the most important thing, however, is the size of the building and development industry in Australia.

“In the United States, the industry is so huge that it’s incredibly tough to move it,” Huston noted. “In a place like Australia, you stand a real chance. Imagine if Melbourne does pass that law and it becomes a green-build-only city. Then there’d be a model we could all point to, and ultimately, that’s what everyone wants: something you can point to when they say ‘show me’.”

In all, the trip renewed Huston’s (and RMI’s) interest in building on our twenty-two years’ worth of cross-pollination—and it offered some valuable lessons. Now, we just have to put what we learned into action.

¹ Australians also use more water per capita than anyone else. See www.savewater.com.au.

Why RMI Doesn't Lobby



Marty Pickett,
Executive
Director

This summer, after the completion of *Winning the Oil Endgame*,

RMI CEO Amory Lovins and Communications Director **Karen Nozik** will take the report to Washington to share its findings with various groups. There is a lot RMI could say publicly about the report, but instead, we plan to quietly but eagerly share it with anyone who wants to read it. We will also seek audiences whom we think will be particularly interested and could leverage the report's findings.

Over the years, our supporters have often urged RMI to comment on Congressional and Administration proposals, but the Institute has found that

it's more important that we analyze the outcomes and avoid political infighting along the way. I'm often asked why. There are two primary reasons:

- 1) It's our policy, set and repeatedly ratified by RMI's board of directors, not to lobby. RMI is legally entitled as a 501(c)(3) nonprofit to do a small amount of lobbying (we were recently told by a lobbying specialist we could spend up to 15 percent of our budget on lobbying). But the Institute has consistently chosen to be nonpartisan and apolitical as part of our organizational identity.
- 2) Our material on specific issues like oil and national security will be more credible if we produce it transparently, then share it with everyone. We're particularly intentional about how we disseminate our materials and are continually

striving to ensure that our work gets into the hands of decision makers and those who are in positions to influence decision makers. Our approach doesn't prevent lobbying groups on either side of any debate from using or distributing our material—even politicizing it in their own ways. But it allows our work to remain credible, independent, and untainted by the give-and-take negotiation sometimes found in legislation.

We'll continue to stay the course with our non-lobbying protocol. The issues we deal with, and the ongoing possibilities for influence and change, are far too important to politicize. We think our supporters will continue to agree, especially when our work helps make a good case for solutions-based change.

Editor's Notes

Creative Arithmetic and WTOE



Cam Burns,
Editor

By now you've obviously heard about RMI's latest effort, *Winning the Oil Endgame*.

Already, friends and supporters who haven't read the entire document are asking for the five-minute elevator version. They want to know what the report is for, who the audience is, and how it can be used to make this country (and the world) safer and better.

First I'm going to point out what the report is not. It is not a political tool, prepared for the upcoming election. Second, the report is not an advocacy document; yes, it does suggest things

like scrappage fees or tax incentives for automakers to build hybrids (because they make sense; but it is not a position on a single issue).

What this report is really about is creative arithmetic. It adds up numbers never brought together in a way that shows a clear, safe, just, honest, environmentally responsible way for the United States to get off oil.

Winning the Oil Endgame examines four ways to displace oil—end-use efficiency, substitution of saved natural gas in appropriate applications, biofuels and waste-derived fuels, and hydrogen—and then matches those supplies to the demands for energy. This might sound like an impossible equation (e.g., who's going to pour

safflower oil in their tank, right?), but the report is not just about supply and demand. Rather, it incorporates a whole web of ideas on efficiency and fuels with data and suggestions on technologies, business concepts, public policies, and customer choices.

Once you get into *WTOE* and start looking at all the viable options the United States has, you'll see that this nation's biggest problem has been a lack of creative arithmetic. There are "patterns that connect" in every realm of human endeavor, and the patterns in *WTOE* are rich, smart, and right. So remember, read it, enjoy it—and keep asking yourself what other ways there are to creatively relieve U.S. oil dependence.

“Mostly I’ve been taking advantage of the remarkable learning opportunities at RMI as I’ve worked my way through the Institute’s various operations.”

Tyler Lindsay

Editor’s note: In this issue of RMI Solutions we feature the work of our interns.

Jen Boulden

I was recruited by RMI to help with strategic planning at the Institute. Having just completed an MBA in environmental management and having held a similar position at the World Resources Institute in Washington DC,



I could not pass up the opportunity to move out West and help another great “think and do tank” do its thing even better. Specifically, I am helping to develop the strategic plan (which will establish where RMI should go and presents options on how to get there) for the October Board meeting, as well as performing a review of our consulting services to determine how effectively we are turning RMI ideas into real-world practices.

Alex Chase

With support from the Minerals Acquisition Partners Sustainable Energy Fellowship program, I am contributing to RMI’s ongoing work on health care facilities by researching and showcasing innovative ways in which whole-system design can greatly improve resource



efficiency while enhancing the healing and working environments of hospitals, clinics, and other facilities. Specifically, I am helping prepare an “Innovation Design Summit” for Massachusetts health care decision makers. The summit will demonstrate how green hospital design is not only good for the environment, but also improves patient recovery rates, staff productivity and retention, and the financial bottom line.

Tyler Lindsay

As web research intern for the Communications Department, I was hired to find organizations similar to RMI and link with their websites, as well as to register with search engines in an effort to increase traffic to our website. While I’ve done plenty of that, my work has branched out to include helping on the footnotes and bibliography for *Winning the Oil Endgame*, as well as producing a video of Amory’s WTOE presentation that will be downloadable from www.rmi.org. I have also found myself sourcing images and obtaining copyright permissions for a Powerpoint presentation on natural capitalism, which should allow even the relatively uninitiated to understand natural capitalism’s principles. Mostly, though, I’ve been taking advantage of the remarkable learning opportunities at RMI as I’ve worked my way through the Institute’s various operations.



Ann Rodriguez

At RMI, I worked on *Winning the Oil Endgame*, on a demand response program for the Nevada Power Corporation, and on a case study on marketing sustainable products. Following my internship with RMI, I will be doing a four week internship in resort management at the Inn of the Seventh Mountain in Bend, Oregon. Then I will return to Palo Alto for my second year of graduate studies at Stanford’s School of Business.



Cody Taylor

I’ve been working with Green Development Services on a new development near Sydney, Australia. I spend most of my time researching relevant examples of other developments that have been designed with green features and compiling lessons about their successes and failures. This way I can help the Australian developer capitalize on the experience of others. I’m also working with the Energy & Resources Services team to draft a greenhouse gas reduction plan for a major government research lab.



Odd-Even Bustnes, RMI Research & Consulting



If you read the biographies of most RMI staff members, they show backgrounds as diverse as those of any organiza-

tion, but the biography of researcher/consultant Odd-Even Bustnes is about the most fascinating of them all.

First there's the raft of education. Then there are his athletic endeavors, including rowing on the Norwegian National team in the 1996 Atlanta Olympic Games and mountaineering in Asia. Then there's the working career, which ranges from a survey of water systems in the Peruvian Andes

to analyzing various sorts of businesses and business models—ranging from renewable energy systems to shipping.

But it's what's not on his bio that makes the Washington DC resident remarkable. Odd-Even was born and grew up in Norway until the age of thirteen. Then, his father took a job with Norwegian AID (NORAD) in Zambia, where the family moved. After two years in Zambia, the young Odd-Even headed off to an international boarding school in Swaziland for a year and a half. Odd-Even liked the school so much that after he returned to Norway in 1987, he immediately sought out a similar learning environment, and that year ended up at the Armand Hammer United World College of the American West, in Montezuma, N.M. After a stint as a paratrooper with the Norwegian military ("I figured if I had to go into the

military I might as well have fun, right?") he earned a bachelor's degree in engineering at Dartmouth, a master's degree in public administration and economics at Princeton, and a master's degree in chemical engineering at Oxford.

Odd-Even likens his early life and schooling to that of a typical young traveling Australian—always looking around to see what matters, what doesn't, and what is plain interesting. Not surprisingly, his working career is taking a similar path.

"I think of myself as someone who's constantly searching for something that is good," he said, "whether it's climbing mountains or working on a project to save the planet. I don't believe I'm suited to specializing in one thing."

RMI *in the news*

Alexis (and Biophilia) Featured in *Colorado Homes & Lifestyles*

Alexis Karolides, AIA, team leader of RMI's Green Development Services, was recently featured in a major story about *biophilia* (the human need to associate with nature and natural processes) in *Colorado Homes & Lifestyles* magazine.



In the August 2004 issue, Associate Editor **Cyndia Zwahlen** interviewed Alexis about biophilia, which has become one of RMI's most significant research projects. Titled "Natural Attraction," the article covers parts of seven pages, and features images of RMI's headquarters building and Fallingwater, a home in Western Pennsylvania designed by Frank Lloyd Wright.



Zwahlen describes biophilia as a new area of importance for many architects and designers. "Interest in it is growing," she wrote, "as increasing evidence shows that people actually require a connection to the natural environment to work more productively, live more healthily, and recover from stress and injury more quickly." The key question, Zwahlen noted, is how to best incorporate nature into the human environment. Alexis lays out the answer (noting that access to a view is often the simplest thing to do), and also points out that in the West (e.g., Colorado) biophilic design is more important than ever. "Economically, the Colorado lifestyle depends on this," she said. "If we carve the state up into little subdivision plots we are losing some of that wonderful economic driver that our natural resources provide. But more important than that, the natural ecosystem provides services for us in Colorado. It provides clean air, water filtration, protection from floods and cooling—an antidote to the heat islands caused by too much pavement."

"I think of myself as someone who is constantly searching for something that is good, whether it's climbing mountains or working on a project to save the planet. I don't believe I'm suited to specializing in one thing."

In 1997, Odd-Even took a job with the United Nations Children's Fund (UNICEF) analyzing water systems in Peru. The experience taught him three important points. "First, that while you and I might take clean water for granted, hundreds of millions of people have to go without it everyday," he said. "Second, that understanding of things like water contamination—and other ills—is outside the comprehension of many people, especially children. Water is transparent, and to them that means there's nothing threatening in it. Kids—but also their parents—can be especially bound to phenomena by what they can observe." Third, the Peruvian stint confirmed the importance of understanding complete systems. Many of the water quality problems Odd-Even dealt with were related to simple issues like having livestock grazing too near water sources and distribution points. In recycling their "grazings" nearby, Peruvian villagers would often wind up with E-Coli bacteria in their drinking water. "Doing something about securing good health through clean water is therefore not just about dropping some capital, a group of engineers, and finally a water system, into a village," he said.

Another job Odd-Even thinks is important to his eventual arrival at RMI is one he had analyzing a utility's coal-fired power plants. The utility was trying to estimate which plants should be "patched up," as Odd-Even put it, and which should be shut down. Since the accounting for a coal-fired power plant didn't exactly include a tally of all the bad and costly things the plants actually do (economists sometime label these unaccounted costs "externalities"), he found himself suggesting that certain plants remain in operation. While

Odd-Even is quick to point out that the past two decades have seen big gains in pollution regulations, for example limits on mercury and sulfur dioxide emissions, it was a life-changing experience.

"I realized I was helping to continue a dependence on coal plants," he said. "And, knowing the consequences of patching up old coal-fired power plants, it made me realize I should be doing something else with my time." Not long thereafter, Odd-Even joined RMI.

These days, he has been working on RMI's latest major report, *Winning the Oil Endgame*. Many of WTOE's researchers have been heavily focused on efficiency and technology advances in the U.S. car and light truck fleet, as well as buildings and industry. Odd-Even, meanwhile, has been estimating oil savings and their costs through gains in efficiency and changes in technology for all the other transportation-related oil end uses: primarily trucking, but including aviation, rail, shipping, and mass transit, as well as the production of asphalt.

He has also been looking at the business case for realizing the opportunities offered by efficiency in the trucking industry ("margins would double, from about 3.2 percent to around 6.7 percent," he notes), as well as a couple of policy components of the report. One component outlines scrapping and replacing inefficient clunkers mainly owned by low-income Americans, and another has to do with large-scale procurement mechanisms that target efficient vehicles.

"Most likely, many Americans neither realize the energy gains achievable through turning over the car and light truck fleet—much less so if we accelerate turnover via sound business decisions and a small dose of leadership in public policy—nor the knock-on benefits to national competitiveness and security from making these gains happen," Odd-Even says. "Business models that aim to embrace the opportunities from the coming changes to the oil demand and supply sides, along with policies to address responsible acceleration of vehicle stocks, therefore hold key positions among the recommendations in this report."

Not only does *Winning the Oil Endgame* prove that off-the-shelf technologies now available are cheaper than buying the oil, Odd-Even points out, the report also lays out the competitive and security rationales for why taking no action today is unwise.

"Finally, we also outline in detail what actions, if taken today, would be more helpful in order to put us on a path we, and the rest of the world, would be much better off treading," he says. "Clearly, this is a very important project."

—Cameron M. Burns

RMI *in the news*

Rocky Mountain Institute Joins Chicago Climate Exchange

RMI has joined the Chicago Climate Exchange®, Inc. (CCX), a market-based exchange created for companies to buy and sell credits in greenhouse gas emissions. As an associate member, the Institute will quantify its greenhouse gas emissions each year, then, through the Exchange, buy an equivalent number of carbon dioxide credits to offset its emissions. RMI will then permanently retire the credits, effectively mitigating the Institute's impact on global climate change.



Year	CO2	CH4	N2O	HFC	PFC	Total
2001	10,000	1,000	1,000	1,000	1,000	14,000
2001	10,000	1,000	1,000	1,000	1,000	14,000

The Exchange is the first system in which entities from the public and private sectors enter into legally binding commitments to use a rules-based market for reducing their greenhouse gas emissions. Although RMI does not directly emit greenhouse gases through stationary fossil fuel combustion, it contributes emissions of greenhouse gases through business-related travel, heating fuel purchases, and some electricity purchases. (Much of RMI's electricity already comes from wind and solar sources, and the Institute uses exceptionally energy-efficient buildings and equipment.)

“Rocky Mountain Institute’s experience and expertise in linking organizations’ profits to environmental sustainability, and energy use management in particular, is world-renowned,” said **Richard L. Sandor**, chairman and CEO of the Exchange. “We are very excited to be able to facilitate RMI’s linkage to the greenhouse gas emissions trading market. Its participation will serve both the development of CCX and the business goals of its clients.”

“Joining the Chicago Climate Exchange takes a step further the work RMI has already done with several clients to reduce their climate-related risks,” said **Joel Swisher P.E.**, team leader of RMI’s Energy & Resources Services. “Participation in the Exchange will help us share information and experience with other members. We plan to explore ways to combine direct emissions reductions with trading credits as a risk mitigation strategy for our clients.”

RMI’s climate-related work includes a greenhouse gas emissions inventory for the Stanford Linear Accelerator Center, a generation risk analysis for the Nebraska Public Power District, and emissions-related strategies for other corporate clients. *The New Business Climate*, written by Swisher and published by RMI, is designed to help companies analyze their greenhouse-gas-related risks and determine appropriate mitigation strategies. It is available at www.rmi.org/store/p12details2421.php.



Other CCX associate members include the non-profit World Resources Institute, the law firm Foley & Lardner, and the consulting firm Global Change Associates. The Exchange has more than sixty members, twenty-two of which are industrial corporations, electric power producers, universities, and municipalities that have committed to reducing greenhouse gas emissions from stationary fossil fuel combustion by 1 percent per year during the course of a CCX pilot program (2003–2006). Net emissions from these members with direct greenhouse gas emissions from on-site fossil fuel combustion will be 4 percent below the baseline average in 2006. Members with direct emissions include American Electric Power, International Paper, DuPont, IBM, the City of Chicago, and the University of Oklahoma.

“RMI is excited to work toward climate neutrality with its carbon emissions, both for the environmental benefits and the business case it will help us promote,” said RMI CEO **Amory Lovins**. “RMI’s work with clients to create climate mitigation strategies has shown us that greenhouse gas trading can play an important role in those strategies.”

For more on CCX, please visit www.chicagoclimatex.com.

—Jenny Constable

Australia's First Biodiesel Fleet

By Rodney Ingersoll

The Australian city of Newcastle sits at the mouth of the Hunter Valley, a region best known for its high-quality wines, quaint country towns, and—perhaps incongruously—its considerable coal production, this last item being the muscle behind Newcastle's decades-old steel industry.

But Newcastle today is not the same city. Today there is a growing recognition around Australia that fossil fuels create a raft of problems, from climate change to asthma, and some of Newcastle's citizens have been at the forefront of curbing carbon emissions. In fact, one of RMI's climate change interns came from Newcastle, and RMI has participated in various emissions reduction activities focusing on the city of 140,000. Recently, the Newcastle city council became more involved in climate change-related issues and launched Australia's first biodiesel fleet.

Bio-what?

Biodiesel is a clean-burning fuel made from renewable sources, such as recycled restaurant oils. It may or may not include all the standard cooking oils (canola, sunflower, soy bean, cottonseed, etc.) and animal fats.

International studies suggest biodiesel produces fewer emissions than regular diesel, and that it can, for the most part, be used in unmodified diesel engines and can use current fuelling infrastructure. It is safe, biodegradable, and reduces serious air pollutants and toxins, such as various types of particulate matter, carbon monoxide, and uncombusted hydrocarbons.

The benefits of biodiesel for Newcastle are fourfold: one, there are the environmental benefits inherent in reducing our reliance on burning fossil fuels; two, there is the reduction of bio-waste going into landfills; three, there is the reduction of tailpipe smoke, which contributes to visibility problems; and four, the city saves money because biodiesel is a cheaper fuel. It's a win-win-win situation for the city.

Recently, a petition drawn up by some of Australia's leading scientists and submitted to Parliament put cleaner fuels at the forefront of the health debate. The group has called on Parliament to set politics aside and adopt cleaner and safer fuels for the sake of the nation's health. Among other things the group noted that, "There are twice as many deaths resulting from air pollution in our capital cities [as there are] from road accidents."

Newcastle's biodiesel program began in November 2001, when the city council adopted the "Greenhouse Action in Newcastle" (GAIN) plan as part of its commitment to the Cities for Climate Protection (CCP) program. The mandate for the city council was to "continually investigate options to convert council's fleet to alternatively-fuelled, lower-emissions vehicles."

In mid-2002, the city tested a "B20" biodiesel blend (20 percent biodiesel and 80 percent regular diesel) in a dump truck and a B100 blend (100 percent biodiesel) in the city's "Flower Power" *Kombi* van. The tests indicated a 33 percent reduction in carbon monoxide emissions and a 26 percent reduction in black smoke.



Peter Dormand (City Energy Manager) and Andrew Hill (Biodiesel Industries Australia) with the "flower-powered" *Kombi* test vehicle.

Photo courtesy Newcastle Herald.

By the Numbers

Newcastle has a motor vehicle population of over 100,000, which contributes 14 percent of the city's greenhouse gas emissions. In 2002, a total of 430,000 tonnes carbon dioxide equivalent were recorded and, if current trends continue, these emissions will certainly rise (see www.climatecam.com).

In November 2003, biodiesel was introduced into 228 diesel powered vehicles and pieces of plant equipment, building on the previous eighteen months' experience. All vehicles are running as well or better than they did on regular diesel.

To help promote the findings of our extensive emissions analysis, the city council was awarded funds from the New South Wales Department of Environment & Conservation (DEC). A provision to promote the program's results to other Australian cities and businesses through a series of seminars has been implemented.



City officials throw flowers at the launch of Newcastle's alternative fuel project.
Photo courtesy Newcastle city council.

The NSW Roads and Traffic Authority (RTA) and Environment Australia provided additional support to conduct comprehensive emissions testing on thirteen typical council vehicles (they include garbage trucks, passenger cars, and light vehicles).

Newcastle has attracted attention to biofuels by painting big bright yellow sunflowers and the words "Flower Power" on the sides of ten garbage trucks. The garbage trucks are, in effect, a moving billboard, and the branding is an attempt to link the sun's energy to the earth. At the very least it stirs up good, healthy conversations around town.

The use of B20 biodiesel replaced 20 percent of the estimated 1.2 million liters of oil-derived diesel consumed by the city annually with a renewable fuel. This equates to a reduction in greenhouse gas emissions of approximately 590 tonnes annually, or a 14 percent reduction in the city's overall vehicle fleet emissions (including both diesel and petrol powered vehicles).

In a joint initiative, Newcastle's closest neighbor—Lake Macquarie—has contributed an additional two test vehicles to Newcastle's biodiesel program as they investigate emissions reductions with the alternative fuel. Newcastle has also implemented a sustainable transportation policy stating that new vehicles will need to be compatible with biodiesel in order to compete for our business.

The short-term benefits of Newcastle's program include, obviously, the reduction of greenhouse emissions and the reduction of waste cooking oil going into the landfill, but they also include the reduction of vehicle filter replacements, a high level of local awareness (as a result of the publicity through various mediums), and the transfer of results to other local, regional, and municipal governments.

The long-term benefits of Newcastle's program include improved air quality; increased usage of biodiesel by government, industry, and the general public; greater public awareness of the various benefits of biodiesel as an alternative to petro-diesel; and growth of the biodiesel industry in Newcastle and Australia.

Newcastle is proud to be in a position where it can help transform the Australian fuel marketplace. By conducting fuel tests and freely discussing the findings, the future of fuel consumption in Australia is looking more sustainable—especially as other cities take up the "biofuel challenge."

Rodney Ingersoll is energy and resource officer for the city of Newcastle's Energy & Resource Unit. He can be reached at ringersoll@ncc.nsw.gov.au.

RMI *in the news*

RMI's Greener Joins Erb Environmental Management Institute



Catherine Greener of RMI's Commercial & Industrial Services recently joined the Board of Advisors for the Erb Environmental Management Institute at the University of Michigan. The Institute was founded with a gift from U of M grad **Frederick A. Erb** and his wife **Barbara** to study and understand the roles and relationships among businesses, governments, and not-for-profit organizations as they interact and those interactions' affect on the environment. The Erb Institute also addresses interdisciplinary issues involved in solving environmental problems. It is administered by both the University of Michigan Business School and the School of Natural Resources and Environment. For more information, see w.bus.umich.edu/FacultyResearch/ResearchCenters/Institutes/Fabm.

Ray Anderson



Sometimes, those who believe that business can make our economy sustainable start to lose hope. Can we convince all those bottom-

line-driven industrialists that natural capitalism will make their business and the planet better off? But change is afoot, and stories of remarkable people helping business evolve inspire us.

Ray Anderson was once an industrialist without environmental vision. Today he is a member of RMI's board (serving since 2002), and serves on the boards of the Natural Step USA; the Georgia Conservancy; and the University of Texas Center for Sustainable Development. His environmental awards include the George and Cynthia Mitchell International Prize for Sustainable Development; the SAM-SPG Sustainability Leadership Award; and the U.S. Green Building Council's Inaugural Leadership Award.

That's a long list for someone who was not environmentally inclined ten years ago. In fact, most of Ray's biography reads like that of a typical industry baron. He graduated with honors from Georgia Tech in 1956 and spent the next decade and a half moving up in the carpet industry. In 1973 he founded Interface, Inc., bringing carpet tiles to the United States. Interface grew rapidly, and today is the world's largest maker of commercial floorcoverings.

About ten years ago, interior designers, the company's most important customers, asked about interface's environmental strategy. An industry task force was formed to address environmental concerns, and Ray was asked to give the group an environmental vision.

Until that time, Ray's only environmental vision had been to follow regulations. "I was really sweating what to say," he admits. He picked up a book recommended by an employee.

The book was Paul Hawken's *The Ecology of Commerce: A Declaration of Sustainability*. In it, Hawken declares that "businesspeople must either dedicate themselves to transforming commerce to a restorative undertaking, or march society to the undertaker."

"It struck me like a spear in the chest," Ray said. After a life growing his company and its profits, he found a new ideal—sustainability. He admits that he may have been looking for more. "I was concerned about what this child of mine would grow up to be," he says.

Ray began a quest, realizing that at the time, sustainability was undefined—especially in petroleum-intensive businesses like carpetmaking.

Ray assembled a "Dream Team" of outside experts, including Hawken, RMI Cofounders Amory Lovins and Hunter Lovins, Senior Fellow Bill Browning, and several environmental giants like Dave Brower. They helped guide Interface toward sustainability.

Ray describes the quest for sustainability as a mountain higher than Everest. When Interface reaches the summit, the company will no longer have an environmental footprint.

Interface owns one of the country's largest commercial photovoltaic grids and has planted over 12,000 trees to offset carbon emissions. The company has drastically reduced the amount of material used to make its products and is exploring recyclable and compostable carpeting.

"[RMI is] netting the network now. And when it reaches a tipping point, it can have a profound effect."

Ray believes the sustainability initiative helps his employees align their values at home with their work. "It's attracted better people," he notes, "and the best people are staying and working for a shared higher purpose." The initiative earns praise from all sides. Ray was profiled in *Fast Company* and *Fortune*, which in 1997 and 1998 named Interface one of the "100 best [American] companies to work for."

More recently, Ray was singled out in the Canadian documentary film *The Corporation*. The filmmakers conclude that modern corporations are pathologically insane due to their treatment of people and natural resources. Ray is the "good guy" example from corporate America, but doesn't see himself that way. "It only makes me look so good because it makes everyone else look so bad," he says with a gentle Georgia drawl.

Despite the progress, Ray considers Interface about one-third of the way up the mountain and he hopes to reach the summit in his lifetime.

As an RMI Board member, Ray is leading the Institute toward greater achievements. He sees the sustainability movement as a global network of like-minded people. "RMI is an important node in that network," he said. "We're netting the network now. And when it reaches a tipping point, it can have a profound effect."

Evolution never ceases to amaze us. Ten years ago Ray was calling RMI to join his dream team, and now he is one of our trusted advisors. Let the netting continue.

—Jenny Constable

Donor Spotlight

Richard Ford: Adventures in (and out of) Business

RMI's staff members tend to be adventurous types and are known for exploring the richness of life, but one of the Institute's donors—Richard G. Ford of Memphis—has most of us beat hands-down.

Five years ago, Richard—who'd been in corporate management, marketing, and science and technology R&D for three decades—made a career change and became a photojournalist, and began living and recording in words and photographs and videos a series of adventures ranging from the wonderful to the surreal.



Richard Ford, at the helm, off Catalina Island.

They included photographing and videoing the 1999 Eco-Challenge Adventure Race in Patagonia for the Discovery Channel; having tea with Sir Edmund Hillary in his home on the fiftieth anniversary of the first ascent of Mount Everest; extreme acrobatic flying of a Russian fighter jet (with a commander in the Russian Air Force) over the countryside near Moscow; traveling through Cuba and interviewing musicians à la the *Buena Vista Social Club* with Mick Jagger's ex-manager; diving 1,000 feet in a research submarine in the Caribbean; traveling to Cuba a second time and visiting the late Alberto "Korda" Gutierrez, Castro's personal photographer and the man behind the iconic image of Ernesto "Ché" Guevara that has become the world's symbol for revolution; hiking the Grand Canyon via the difficult Old Hance trail; sailing a tall ship in the Pacific, as well as sailing his own 46-foot cutter which he just rebuilt and plans to sail to the South Pacific; scuba diving reefs around the world; shark feeding 80 feet down off Tahiti; interacting with dolphins off the Lower Banks of the Bahamas with Kathleen Dudzinski, the leading

expert in dolphin communication; living with a bush doctor in the rain forests of Belize; elephant trekking in Thailand; dining with astronaut Edgar Mitchell, the sixth man on the moon, to discuss human consciousness and healing with the mind; rebuilding a race car; paragliding down the California coast; and literally dozens of other adventures.

Remarkably, though, Richard's biggest adventures seem to be in business, and in the transformation of society through innovative products and approaches, some with disruptive technology. As a result of his R&D efforts he was awarded five patents for his inventions, including one in Japan, and has licensed and marketed his products internationally. A native of Tennessee, his business career began in the late 1960s, when, after a degree in marketing and psychology, he joined his father's metal fabrication firm, Steelcraft Corp. There, and with his own company Energy Deziign Corp., Richard explored an interest in solar energy and developed solar collectors with greater efficiency than anything previously known—indeed,

with efficiency records unsurpassed to this day. The reflective nonimaging optics he helped design and commercialize for one high-performance solar collector (a series of small silver reflector-troughs with vacuum tube receivers with wavelength-selective absorber coatings) emulated a crab's eye, one of the most efficient light-collecting devices known (he later used the technology to increase the efficiency of fluorescent lighting systems, cutting building utility bills for his international commercial clients by one-third). Richard also pioneered various solar powered absorption-cycle and Rankine-cycle (using torpedo turbines) air conditioning systems. "Then, Reagan came into office and government incentives to promote the use of solar and other renewable energy projects were suddenly eliminated," he said. "Shame on our government for offering so little support for technologies that can readily transform our society to use renewable energy rather than oil. Renewable energy is cost-effective today, clean, and will last forever, but the federal

government and the oil industry effectively discourage and suppress its use. Federal and state governments could, at the very least, promote renewable energy use, even if they did not offer tax incentives. This would be free and we would progress away from oil dependency. Rather, they downplay renewable energy to maintain our oil dependence and stifle energy independence. Future generations will be very angry at us for unnecessarily depleting the earth's and humankind's precious resources."

After many years of lowering building energy bills for clients, Richard came in contact with RMI Co-founder Amory Lovins in the early 1990s at a meeting in Aspen, where Amory was making a presentation on the Hypercar. Richard was immediately struck by the interdisciplinary nature of the problem-solving work being done at the Institute, and became a big supporter.

"RMI is at the forefront of technology in the world, a veritable technology crossroads, and the Institute's solutions are wonderfully wide-ranging, friendly to nature and employ features that nature has refined over millions of years" he said. "RMI tries to find the best outcome for all concerned, which is a philosophy I live by and really appreciate." Richard noted that concepts like Hypercar vehicles—which increase energy efficiency while improving mobility, cutting emissions, and supplying homes with power—address multiple problems with one system. "RMI's approaches are creative and the solutions are expansive," he said, "And they just make good sense."

These days, Richard is still pursuing adventures—most notably in the business world. "One of my life's goals is

developing products and businesses that significantly help the world and which result in great benefit for all concerned, from investors to society to end-users to the earth," he said. "I focus on emerging technologies that will have the greatest likely future significance and impact."

He is an investor in CarbBOOM (www.carbboom.com), which manufactures a great-tasting, carbohydrate gel of concentrated complex carbohydrates with real fruit. The CarbBOOM gel was originally designed for athletes, but Richard got involved because he wanted to add protein so that it could be a complete meal. He sees the new protein/carb gel product as a solution to several important dietary issues, namely weight control; convenience; and poor nutrition in the developing world. "With the addition of the whey/soy protein mixture and vitamins and minerals we can inexpensively and nutritionally feed millions of starving people in developing countries," he notes.

His other current business adventure is with a new company that has developed a disruptive technology toilet, called the Dehydrolet. The Dehydrolet dehydrates and purifies human waste so that it is reduced to a dry, pathogen-free powder. The toilet is initially filled with four cups of water for flushing. Then, during the waste processing, it distills and recycles that water so that it never needs refilling. There is no sewage output—zero—only the clean powder which is blown into a vacuum cleaner-type bag for easy disposal. Combined with a novel graywater treatment system, all of a household's or boat's water is purified, making the device a net generator of clean water. "You no longer need any kind of sewer or water connections," Richard explains. "There will be



Richard (right) with the late Cuban photographer Alberto Korda and, behind, Korda's famous Ché Guevara image.

immediate benefit in the United States in certain areas such as the Florida Keys, where sewage leaching has put a moratorium on new construction, and California, which has a severe water shortage."

But the application is really much more broad because the Dehydrolet system will allow new homes to be built anywhere, regardless of water and sewer connections, and it will allow existing homes to be similarly retrofitted.

"We believe that we have neatly solved the significant environmental problems of sewage discharge and water usage," Richard said, "and these discoveries will change the world positively."

Currently, Richard is also finishing his first book, which is about adventure photojournalism. He has also recently become engaged (to Sallie Goodman), and his new fiance loves adventure as much as he does; it will be interesting to see what they do next. Despite an extremely full life, Richard's support of RMI remains unswerving. "I think extremely highly of RMI's work," he said. "Both what it has historically done and the work that it continues to do. The world is a much better place because of RMI, and I strongly encourage anyone who believes in its work, as I do, to support it. You will not find a better use and value for your money."

—Cameron M. Burns

New Ways to Support RMI

Dale Levy, Development Director



Several weeks ago a supporter from Austin sent a question about contributing to RMI.

“I’d like to sign up to donate \$20 a month, billed to my credit card, to RMI,” he wrote. “I couldn’t see a way to do that on the website. Is this something that RMI is set up to handle?”

You bet we can do this, we told him!

In fact, we have a special group of people we call the Once-A-Monthers. Currently, fourteen people give on a monthly basis to RMI through their VISA and MasterCard accounts. RMI charges a donor’s account each month the amount he or she has decided to give.

Our Texas donor, who is starting a new business, decided he could afford \$20 a month more easily than he could write one check for \$240. So he gave us his VISA card number and will let us do the rest.

Beginning in October, RMI will also offer automatic deduction from checking accounts as a convenient way for supporters to contribute on a monthly basis. Here’s how:

- 1) Complete the form for automatic gift deduction that you will find on our website (www.rmi.org/sitepages/pid246.php), specifying how much you want deducted from your checking account and the date on which you want the deduction to be made;

- 2) Send this form together with one of your checks marked “void” to RMI at 1739 Snowmass Creek Road, Snowmass, Colo. 81654. RMI’s bank, Alpine Bank, will process the form and work with your bank to make sure the automatic deduction happens; and
- 3) Please accept our thank you for choosing this regular and convenient way of giving to RMI.

We’ll continue to charge credit cards for those donors who prefer that method of monthly giving. Either way—charging your credit card account or arranging for an automatic deduction from your checking account—you can conveniently increase your support of RMI.

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For the fifth consecutive year, the **Sandler Family Supporting Foundation** in Oakland has offered a challenge grant to RMI. The Foundation will match gifts of \$10,000 or more (up to \$200,000) from new foundation and individual donors (those who have never given to RMI) between now and 31 December 2004 on a \$.50 per dollar basis. So if a person were to give \$10,000 or more, RMI would receive an additional \$5,000 (or proportionally more) from the Sandler Foundation. That’s what we call high leverage! Please consider this possibility for yourself.

—

We’re grateful to the **Henry Luce Foundation**, based in New York City, for awarding a four-year grant of \$375,000 for a project we hope will transform the way the electric utility industry operates. RMI’s Energy & Resources Services team plans to

demonstrate the economic, reliability, and environmental value of a distributed resources approach at three utilities in the United States and Canada. Our goal is to encourage a shift from the centralized power generation business model to one that is distributed, while at the same time more efficient, secure, and resilient. The cause of the August 2003 failure of the Northeastern power grid was its centralized design, and the blackout illustrates the vulnerability of the U.S. power system to accident or attack. Conventional wisdom would suggest spending \$50–\$100 billion to make the system larger, with new transmission lines and power plants. While some improvements to existing transmission lines might be appropriate, making the system larger, more redundant, more cumbersome, and more expensive does not address the underlying flaw: the grid is designed to shut down if any part of it experiences a problem. Our view is that investments in energy efficiency, combined with a distributed power system that places smaller, modular electrical resources across the grid close to the loads they serve will lower electrical bills, reduce emissions from power plants, and provide secure, reliable power that would be difficult to disrupt.

The project was initially funded with a 2003 gift from **Deborah Reich** of New York; the grant from the Luce Foundation in 2004 completed the funding for this project. Many thanks to both of these donors for supporting this important, paradigm-shifting work.

Our sincere appreciation is offered to these friends who have contributed to RMI between 16 April 2004 and 15 August 2004. 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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RMI in the news

RMItes Volunteer for Literacy



Missy, with Elia.

RMI employees are well-known for their volunteering efforts, but one of the more focused areas of effort for Institute staffers is a local English literacy program. During the past few years about a dozen RMItes have volunteered for the Basalt Adult Literacy Program, teaching mostly foreign students how to read (and speak) English.

“It’s wonderful and very rewarding,” said **Missy Morgan**, scheduling assistant for Institute CEO Amory Lovins. “It really makes you feel like you’re contributing to the community, especially because you’re bringing together two cultures through a constructive process. And we laugh a lot, so it’s doggone fun.”

Missy is one of four RMItes currently teaching in the program (**Sara Weiss**, and **Jen Seal**, and **Anne Jakle** also volunteer). Missy’s student is a thirty-something El Salvadoran woman named Elia, who has been in the United States nineteen years. “Her English is starting to get really good,” Missy said, noting that Missy’s own *very* Southern accent occasionally shows up in a few of Elia’s pronunciations (“I correct those when they occur—myself first, then Elia”).

According to Program Director **Julie Fox-Rubin**, volunteers are asked to commit one hour a week for six months. The program is “extremely flexible,” she said, allowing volunteers to teach in whatever style and setting works best for them; lessons can range from fields trips to traditional classroom-style programs. The local students hail from about fifteen countries, mostly Latin American nations but China, Japan, Myanmar, Taiwan, Turkey, Morocco, and Slovakia—among others—are also represented. Fox-Rubin said there are about twenty students on the waiting list at present, all “very eager to start learning.” For more information about the program or to volunteer, contact Fox-Rubin at 970-927-9745 or foxrubin@marmot.org.

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Wills

Below is suggested wording for including RMI in your will. But we also suggest you consult with your attorney.

"I hereby leave _____ percent of my estate (or a fixed amount, specific property, or the remainder of my estate) to Rocky Mountain Institute, a Colorado nonprofit corporation, whose purpose is to foster the efficient and restorative use of resources to make the world secure, just, prosperous, and life sustaining."

Winning the Oil Endgame

Four integrated steps to save (and substitute for) oil:

- Apply creative business models and public policies

CONTINUED FROM PAGE 2

efficient vehicles can cut the official forecast of oil use by 29 percent in 2025 and another 23 percent soon thereafter—52 percent in all.

Enabled by a new industrial cluster focusing on lightweight materials, such as carbon-fiber composites, advanced-technology vehicles can revitalize these three strategic sectors and create important new industries.

- Provide another one-fourth of U.S. oil needs by a major domestic biofuels industry. Recent advances in biotechnology and cellulose-to-ethanol conversion can double previous techniques' yield, yet cost less in both capital and energy. Replacing fossil-fuel hydrocarbons with plant-derived carbohydrates will strengthen rural America, boost net farm

income by tens of billions of dollars a year, and create more than 750,000 new jobs. Convergence between the energy, chemical, and agricultural value chains will also let versatile new classes of biomaterials replace petrochemicals.

- Use well established, highly profitable efficiency techniques to save half the projected 2025 use of natural gas, making it again abundant and affordable, then substitute part of the saved gas for oil. If desired, the leftover saved natural gas could be used even more profitably and effectively by converting it to hydrogen, displacing most of the remaining oil use—or all of the oil use if modestly augmented by competitive renewable energy.



These four shifts are fundamentally disruptive to current business models. They are what economist Joseph Schumpeter called “creative destruction,” where innovations destroy obsolete technologies, only to be overthrown in turn by ever newer, more efficient rivals. In *The Innovator's Dilemma*, Harvard Business School professor Clayton Christensen explained why industry leaders often get blindsided by disruptive innovations—technological gamechangers—because they focus too much on today's most profitable customers and businesses, ignoring the needs of the future. Firms that are quick to adopt innovative technologies and business models will be the winners of the 21st Century; those that deny and resist change will join the dead from the last millennium. In the 108-year history of the Dow Jones Industrial Average, only one of twelve original companies remains a corporate entity today—General Electric. The others perished or become fodder for their competitors.

RMI in the news

Hypercar, Inc. Changes Its Name

FIBERFORGE

Hypercar, Inc. is now Fiberforge.

The RMI spin-off, formerly known as Hypercar, Inc., has changed its name to better reflect the company's new direction and its goal of lowering the cost of high-volume advanced-composite structures.

According to Fiberforge Public Relations Manager **Kari Walter Rowley**, the Hypercar name and brand were built around the development and production of hyper-efficient cars. After several years' work in whole-car design, the company decided that lightweight, safe, composite autobodies were a prerequisite for hyper-efficient cars, and it subsequently shifted its focus and invented the Fiberforge process—a process for manufacturing composite autobodies and other lightweight components.

“Our company's business strategy became focused solely on composites more than a year ago,” Rowley said. “A name change was long overdue.”

The name change has not changed the company's mission regarding sustainability. The firm expects Fiberforge technology to become an indispensable key for making more efficient cars, or as we like to call them, “hypercars.”

“Over the company's life—as Hypercar Center within Rocky Mountain Institute, as Hypercar, Inc., and today as Fiberforge—one fact has remained constant: cars must get lighter in order to save energy,” said Rowley. “More than any other technology or materials (aluminum, etc.), Fiberforge has the greatest chance of becoming the foundation for safe and efficient cars.” We wish the gang at Fiberforge luck. For more information, please visit www.fiberforge.com.

What policies are needed?

American companies can be among the quick leaders in the 21st century, but it will take a cohesive strategy-based transformation, bold business and military leadership, and supportive government policies at a federal or at least a state level. *Winning the Oil Endgame* charts these practical steppingstones to an oil-free America:

- Most importantly, revenue- and size-neutral “feebates” can shift customer choice by combining fees on inefficient vehicles with rebates to efficient vehicles. The feebates apply separately within each vehicle-size class, so freedom of choice is unaffected. Indeed, it’s enhanced as customers start to count fuel savings over the vehicle’s life, not just the first few years, and this new pattern of demand pulls superefficient vehicles from the drawing-board into the showroom.
- We propose a scrap-and-replace program that leases or sells superefficient cars to low-income Americans—on terms and with fuel bills they can afford—while scrapping clunkers. This makes personal mobility affordable to all, creates a new million-car-a-year market for the new efficiency technologies, and helps clean our cities’ air.

- Meanwhile, military needs for agility, rapid deployment, and streamlined logistics will drive Pentagon leadership in developing key technologies.
- Implementing smart government procurement and targeted technology acquisition (the “Golden Carrot”) for aggregated buyers will accelerate manufacturers’ conversion, while a government-sponsored \$1-billion prize for success in the marketplace, the “Platinum Carrot,” will speed development of even more advanced vehicles.
- To support U.S. automakers’ and suppliers’ need to invest about \$70 billion to make advanced technology vehicles, we suggest federal loan guarantees for initial retooling where needed; the investments should earn a handsome return, with big spin-off benefits.
- Similar but simpler policies—loan guarantees for buying efficient new airplanes (while scrapping inefficient parked ones), and better information for heavy truck buyers to spur market demand for doubled-efficiency trucks can speed these oil-saving innovations from concept to market.



- Other policies can hasten competitive evolution of next-generation biofuels and biomaterials industries, substituting durable revenues for dwindling agricultural subsidies and encouraging practices that protect both topsoil and climate.

What happens to the oil industry?

The transition beyond oil is already starting to transform oil companies like Shell and BP into energy companies. Done right, this shift can profitably redeploy their skills and assets rather than lose market share. Biofuels are already becoming a new product line that leverages existing retail and distribution infrastructure and can attract another \$90 billion in investments. By following this roadmap, the United States would set the stage by 2025 for the checkmate move in the Oil Endgame—the optional but advantageous transition to a hydrogen economy and the complete and permanent displacement of oil as a direct fuel. Oil may, however, retain or even gain value as one of the competing sources of hydrogen.

How big is the prize? Investing \$180 billion over the next decade to eliminate oil dependence and revitalize strategic industries can save \$133 billion every year by 2025. This savings,

CONTINUED ON NEXT PAGE

RMI *in the news*

Primer on Sustainable Building Reprinted Again(!)

RMI’s popular *A Primer on Sustainable Building* is going into its third edition. Originally written in the mid-1990s by **Diana Lopez-Barnett** and **Bill Browning**, the book explains how a holistic approach to design can result in a building that’s better than the sum of its parts. Aimed at architects, developers, general contractors, landscapers, and homeowners, the *Primer*’s topics include site and habitat restoration, transportation integration, edible landscapes, energy-efficient design, materials selection, indoor air quality, and cost implications, plus an extensive bibliography and source lists. The *Primer* was updated in 1999, however, in the past few years it has sold well, prompting another update this spring. Various members of RMI’s Green Development Services team updated the third edition, copies of which are now available. For more information, please visit RMI’s online bookstore at www.rmi.org.



Winning the Oil Endgame

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equivalent to a large tax cut, can replace today's \$10-billion-a-month oil imports with reinvestments in ourselves: \$40 billion would pay farmers for biofuels, while the rest could return to our communities, businesses, and children. Several million automotive and other transportation-equipment jobs now at risk can be saved, and one million net new jobs can be added across all sectors. U.S. automotive, trucking, and aircraft production can again lead the world, underpinned by 21st century advanced-materials and fuel-cell industries. A more efficient and deployable military could refocus on its core mission—protecting American citizens rather than foreign supply lines—while supporting and deploying the innovations that eliminate oil as a cause of conflict. Carbon dioxide emissions will shrink by one-fourth with no additional cost or effort. The rich-poor divide can be drastically narrowed at home by increased access to affordable personal mobility, shrinking the welfare rolls, and abroad by leapingfrogging over oil-dependent devel-

opment patterns. The United States could treat oil-rich countries the same as countries with no oil. Being no longer suspected of seeking oil in all that it does in the world would help to restore U.S. moral leadership and clarity of purpose.

While the \$180-billion investment needed is significant, the United States' economy already pays that much, with zero return, every time the oil price spikes up as it has done in 2004. (And that money goes into OPEC's coffers instead of building infrastructure at home.) Just by 2015, the early steps in this proposed transition will have saved as much oil as the U.S. gets from the Persian Gulf. By 2040, oil imports could be gone. By 2050, the U.S. economy should be flourishing with no oil at all.

How do we get started? Every sector of society can contribute to this national project. Astute business leaders will align their corporate strategies and

The transition beyond oil is already starting to transform oil companies into energy companies.

Done right, this shift can profitably redeploy their skills and assets rather than lose market share.

reorganize their firms and processes to turn innovation from a threat to a friend. Military leaders will speed military transformation by promptly laying its foundation in superefficient platforms and lean logistics. Political leaders will craft policies that stimulate demand for efficient vehicles, reduce R&D and manufacturing investment risks, support the creation of secure domestic fuel supplies, and eliminate perverse subsidies and regulatory obstacles. Lastly, we, the people, must play a role—a big role—because our individual choices guide the markets, enforce accountability, and create social innovation.

Our energy future is choice, not fate. Oil dependence is a problem we need no longer have—and it's cheaper not to. U.S. oil dependence can be eliminated by proven and attractive technologies that create wealth, enhance choice, and strengthen common security. When the United States last paid attention to oil, in 1977–85, it cut its

RMI in the news

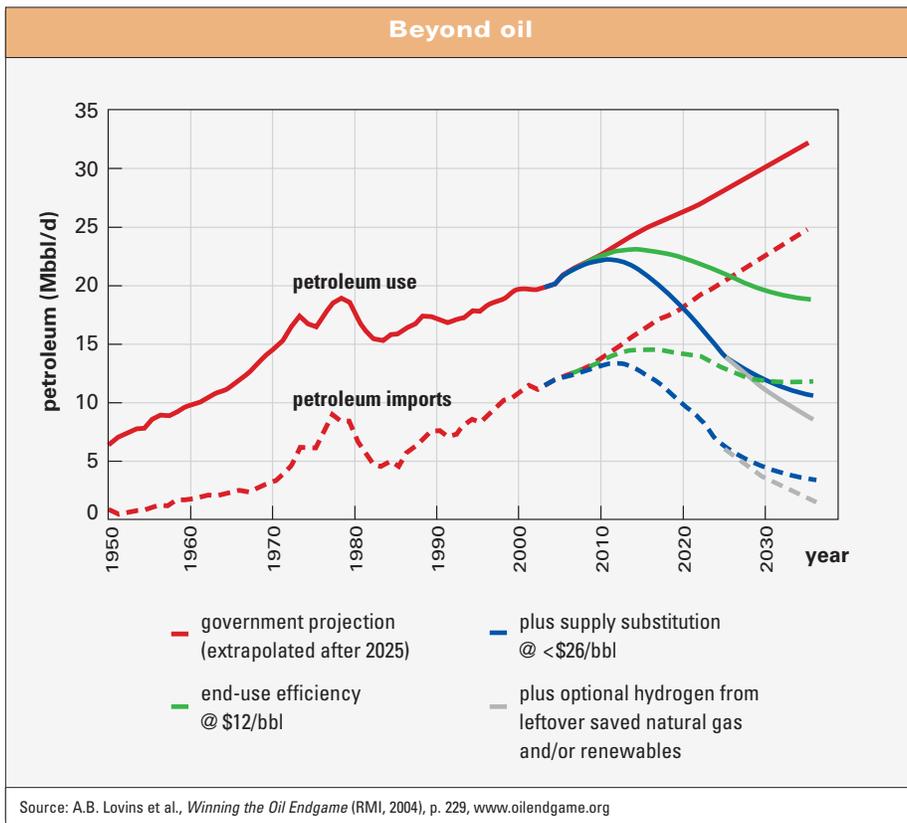
RMI Helps Write Two New Green Building Books

RMItes recently contributed to two books about energy and resource efficient building design. **Jenifer Seal** and **Bill Browning** recently coauthored a book for the **Urban Land Institute**. The book, to be published this fall and tentatively called *The ULI Guide to Green Office Building*, provides “a practical overview of the issues to be addressed in the planning, design, development, and management of a green office building.” Jen and Bill's chapter (“Outlook and Trends”) looks at the history of green building and describes how it developed and where it's going. Seal and Browning interviewed leading developers and professionals in the field to take the industry's pulse. The interviews are featured throughout their chapter. For more information, see www.uli.org.

Building Without Borders is a new compilation of articles and reports about sustainable building in remote and climatically difficult regions, and has a heavy emphasis on local materials, local construction techniques, and indigent populations. Edited by **Joseph Kennedy** and published by New Society Press, the new book includes RMI's report on its 2002 Sustainable Settlements Charrette (see *RMI Solutions*, Spring 2002). For more information, see www.newsociety.com/bookid/3837.



Winning the Oil Endgame



oil use 17 percent while GDP grew 27 percent. Oil imports fell 50 percent, and imports from the Persian Gulf by 87 percent in just eight years, and that exercise of dominant market power—from the demand side—broke OPEC's ability to set world oil prices for a decade. Today we can rerun that play, only better. The obstacles are less important than the opportunities if we replace ignorance with insight, inattention with foresight, and inaction with mobilization. American business can lead the nation and the world into the post-petroleum era, a vibrant economy, and lasting security—if we just realize that we are the people we have been waiting for.

There's nothing to stop Americans from ending oil dependence forever. Details will be refined, but the direction looks right. If we put our hearts and minds together, we can win the Oil Endgame.

See www.oilendgame.org to get started.



To find out more about RMI stuff now on sale, please email us at orders@rmi.org or call 970-927-3851 or visit www.rmi.org/sitepages/pid70.php

RMI Solutions

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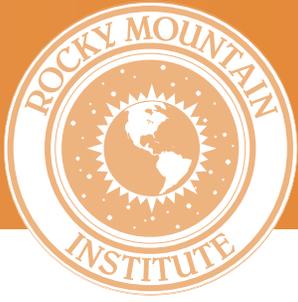
ABOUT THE INSTITUTE

RMI is an entrepreneurial nonprofit organization that fosters the efficient and restorative use of natural, human and other capital to make the world secure, just, prosperous, and life-sustaining. We do this by inspiring business, civil society, and government to design integrative solutions that create true wealth.

Our staff show corporations, communities, individuals, and governments how to create more wealth and employment, protect and enhance natural and human capital, increase profit and competitive advantage, and enjoy many other benefits — largely by doing what they do more efficiently.

Our work is independent, nonadversarial, and transideological, with a strong emphasis on market-based solutions.

Founded in 1982, Rocky Mountain Institute is a §501(c)(3)/509(a)(1) public charity. It has a staff of approximately 50. The Institute focuses its work in several main areas — business practices, climate, community economic development, energy, real-estate development, security, transportation, and water — and carries on international outreach and technical-exchange programs.



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