



RMI Solutions

NEWSLETTER

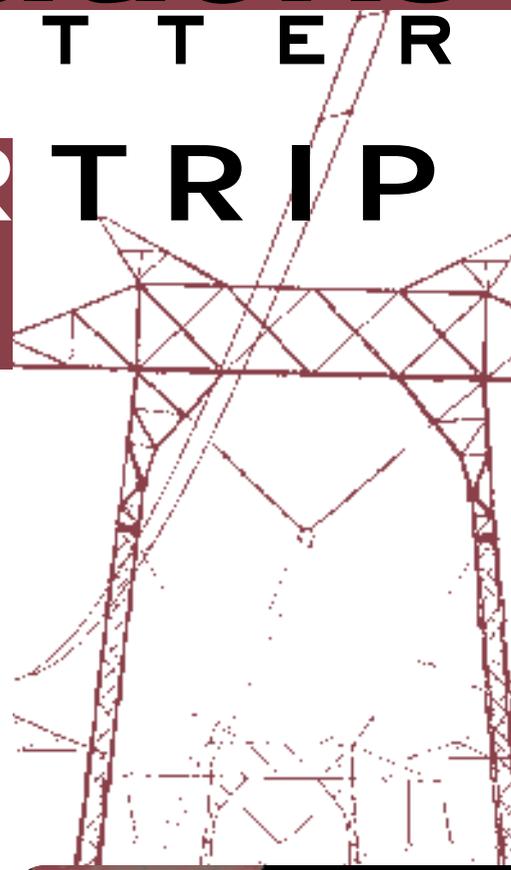
POWER TRIP

LOOKING FOR ANSWERS IN CALIFORNIA

On March 31, 1998, a plain, uninspiring office suite stuffed with the newest computers and dozens of young, idealistic workers—many recent economics graduates—opened for business in Alhambra, California. Physically, there was nothing special about this office—three “horseshoes” of computer banks interspersed with white boards, marked up with the handwritten trading status of buyers and sellers of electricity. The phones and computers hummed away, 24 hours a day, seven days a week. Given the rapid rise of wholesale trading of electricity, this small office near Los

Angeles might have gone unnoticed—just one among hundreds of new energy trading operations that opened in the 1990s. But this one was different. It was at the center of one of the most ill-conceived and disastrous attempts at industrial restructuring in American history. This was California’s new Power Exchange, or “PX,” the centralized trading operation for California’s three largest investor-owned utilities and nearly 80% of all electricity customers in the state. The importance of the Power Exchange goes beyond just the trading that took

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RMI on the Bush Energy Plan

WITH THE RECENT RELEASE OF THE BUSH ADMINISTRATION’S ENERGY PLAN, RMI finds itself once again in a position of being asked to comment. This is no surprise. RMI co-founder and CEO (Research) Amory Lovins is the inventor of the “Soft Path” approach, which turned heads in 1976—and whose then-heretical view of U.S. energy use today is within a few percent of the actual figure.

Unfortunately, most who learn about Amory’s Soft Path don’t quite make the distinction between efficiency and conservation.

“There is a stark difference between conservation and efficiency,” Lovins said recently. “To most Americans, and to the current Bush Administration, conservation means doing with less—less comfort, less mobility, less stuff. It is a change in behavior based on the attitude, ‘Do less to use less.’”

“In contrast, efficiency means getting the same (or often more and better) energy

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With the exception of some aspects of the drug trade—there is no such thing as a free market.

place in its offices. For the architects and champions of the 1996 restructuring law, it represented the core of their beliefs in reduced government regulation and open, competitive power markets.

Yet only three years after opening its doors, California's Power Exchange filed for bankruptcy. This action marked the end of the botched restructuring experiment and nearly a decade of struggle over how to reduce California's high electricity rates. It also marked the beginning of an acrimonious and highly politically-charged debate over how to fix the mess, who is responsible, and who should pay.

The most striking blunder of restructuring, perhaps, was the assumption that a smooth-functioning free market can be crafted into existence almost overnight, and then turned loose even though only a few actors have agreed to participate. The world's best markets—stock markets, for

example—develop over many years, and feature millions of participants. Even then they are heavily regulated. In redesigning California's electricity industry, the architects and engineers of restructuring ignored the essential ingredients of a market, made no provision to protect the public interest, and failed to cast an eye to the future and ponder the possible outcomes—successes and disasters—of the new electricity industry.

"We are reminded once again that market actors do exactly what the market's mechanisms incentivize them to do," says Hunter Lovins, RMI co-founder and CEO (Strategy). "Remember, with the exception of some aspects of the drug trade—there is no such thing as a free market. All markets are regulated in some way and what really matters, as we saw in California, is how those regulations are structured, and how they influence human behavior."

The solutions to California's situation are fairly obvious, yet few are being discussed. They include fixing the basic market structure so that utilities are rewarded for cutting consumers bills instead of selling more electricity, so that consumers are enabled to respond in the market, and so that all parties with a stake in the market are allowed to become players.

CHANGE THE MARKET STRUCTURE

As Hunter observes, electricity industry restructuring in California gave huge incentives to generators to act in exactly the way that they did. Because of this the Power Exchange became center stage, and its story is worth telling.

In reality, the PX was three exchanges—one a "day ahead" exchange, another a "day of" exchange, and a third for long-term contracts (which is still operating). In the PX, distributors needing electricity for the next day submitted details of quantity needed, and the price they were willing to pay. Companies that generated electricity then responded with offers. Every hour, the Power Exchange's computers looked at the requests for power, and at the prices offered, then matched bids on the supply and demand sides. The Power Exchange would later bill those buying the electricity and write checks to those selling it.

In theory this system should work. But the PX also had a built-in "last price bid" system in which the price that every supplier was paid for electricity was determined by the last bid accepted. The idea was to induce electricity producers to offer their power on a timely basis to meet constantly changing levels of demand. Those who stepped up early and offered their

How to Reduce 1300 Power Plants . . .

On April 30, Vice President Dick Cheney told members of the Associated Press that conservation alone would not solve the United States' current energy problems and that a bigger supply of domestic oil along with "an all-out drive to build power plants—one a week for 20 years," were needed. (The official DOE number is 1300.)

According to Bill Prindle, Director of Buildings and Utilities Programs at The Alliance to Save Energy, the 1300 estimate comes from the DOE's macroeconomic model called the National Energy Modeling System (NEMS). But, Prindle says, NEMS, like all models, can be and has been wrong. The 1300-

power plant forecast would drop dramatically if NEMS used the following inputs. They are reprinted here, with permission:

- 230 of the 1300 powerplants are for replacing current units. So the net new demand for power is actually 1070 plants.
- 300 power plants' worth of capacity, already in the pipeline, will come on line by the end of 2002. That leaves the need at 770.
- Appliance efficiency standards for clothes washers, water heaters, and air conditioners, passed by the Clinton administration in January, and agreed to by the Bush administration, will reduce demand by 127 power plants in 2020. That cuts



photo: Cameron M. Burns

energy were rewarded later when the highest bid price of the trading period was paid to all.

For instance, if the last bid accepted in the market is \$35.00 per megawatt-hour, then every supplier selling into the market at that time received \$35.00 per megawatt-hour for their power, regardless of what they bid. If the last bid accepted climbs to several thousand dollars per megawatt-

hour, which it did on many occasions last year, every supplier selling into the market at that time would be paid several thousand dollars per megawatt-hour, (often 100 times the cost of generation).

The combination of these two features—arbitrarily forcing all transactions onto the PX's "spot" market and adapting a "last price bid" system— might not have been a problem if numerous generators were selling electricity. In fact, electricity generators of all size, shape and technology were expected to jump into this new, open and competitive "free market" with the publicly announced goal

being healthy competition and lower prices for consumers. Unfortunately, very few participants decided to play. This resulted in a wholesale electricity market controlled by a half dozen companies.

With only a few generators selling electricity into the system, they developed the art of withholding—not supplying any power until Californians were screaming

for just a few kilowatt-hours, then turning around and offering it for whatever price they wanted. The California Independent System Operator, the public agency charged with ensuring the reliable operation of the grid, had no choice but to pay the last generators' prices to everyone.

RMI's Amory Lovins likens the situation to "a ticket scalper's paradise"—high prices reigned when the last increment of supply was demanded. But in ticket sales, the prices paid to early sellers stays low. In California, all sellers got the highest rates.

Utilities, squeezed between huge wholesale prices and limits on what they could charge customers, started losing money. Many of the smaller generators—including "green" energy suppliers (required to mix their electricity with conventional supplies before selling it), couldn't handle the high prices nor the wait required for payment.

"What restructuring did," says Hunter Lovins. "was kill the market for renewables. A lot of those folks were put into a situation where they weren't being paid. Higher prices for electricity should have helped renewables, but because of this weirdly regulated system, they didn't."

Despite speculation about what might be currently happening in California, the system needs stabilization and correction immediately.

... to 170 Power Plants, or Fewer

the need to 643.

- If the Bush administration supported the air conditioner standard at the SEER (Seasonal Energy Efficiency Ratio) 13 level approved by Clinton, instead of the reduced SEER 12 level they announced in April, another 43 plants would be saved, reducing the need to 600.
- Pursuing strong standards for commercial air conditioning would save another 50 plants, cutting the need to 550.
- Programs to reduce energy use in new buildings, such as building energy codes, tax credits, and public benefit programs, would avoid 170 power plants. That means reducing new

homes' demand by one kilowatt per home, and new commercial building demand by 1 watt per square foot. Modern building codes alone can easily achieve those kinds of savings; doing so takes the need down to 380 power plants.

- Programs to improve existing buildings, by targeting residential air conditioners, commercial lighting, and commercial cooling, can trim demand projections by another 210 power plants. That leaves the tally at 170.

This estimate is a good start, but 170 plants are probably unnecessary too. Highly creative efficiency can easily push the number to zero, even lower. An upcoming RMI publication, "Small is Profitable," details how to do this. 

STOP PRESS:

1 July data (www.energy.ca.gov/electricity/peak_demand_reduction.html) show that during January–June 2001, Californians' electricity savings cut weather-corrected peak load by 4.76 GW or 12.2%, electricity usage 10.5%—reversing 5–10 years of normal demand growth. Per GDP dollar, customers cut weather-corrected peak load 14.1% and electricity usage 12.3%. This may accelerate as surcharges boost bills (starting mid-June), summer heat tightens reserves, and reinvigorated demand-side programs expand. Result: from June 2000 to the hotter June 2001, days with peak loads above 40 GW fell from ten to zero; Stage 1 or 2 Power Emergencies, from 6 and 3 to 0 and 0, respectively (this summer's first was 3 July). Of the 17 GW of new in-state generation proposed since 1997, 6 GW is being built, 1 GW online. Are we into overshoot yet?

—*Amory B. Lovins*

ENCOURAGE THE EMERGENCE OF A COMPETITIVE MARKET

Fixing the market involves many changes. Some are underway, but many are being ignored. In January, the state began inter-

vening to stabilize prices by getting supplies under long-term stable contracts. The short-term, spot market is a good way to establish price signals for the marketplace, but it's a crazy way to manage the electrical supply for the world's fifth largest economy. However, a complete rejection of the market would be just as crazy. While long term contracts should dampen the volatility of prices, they raise the concern that the state will be stuck buying electricity at today's high prices well into the future. Additionally, the state's current direction creates the likelihood that ratepayers will be stuck paying for expensive stranded investments. Using indexing schemes similar to those used in the natural gas industry should help alleviate the problem by limiting upside and downside risks for both sides.

The best solution would allow California's electricity market to evolve gradually. When given the chance, markets can create much of their own long-term stability. But regulators need to play a role as well. They must ensure a diversity of players, a level playing field so that there are no barriers to generators, distributors and consumers, and no handicaps or advantages for industry players based upon size, location or ownership. In California's re-regulation, the big players were given

unfair advantage to induce them to agree to the deal in the first place. The losers were everyone else.

While short-term measures like price caps may be helpful to stem the worst price swings, policymakers should keep in mind that the basic structure and the problems of the initial re-regulation are still in place.

CALIFORNIA'S EFFICIENCY RULED

The crisis in California has wreaked serious damage, not only to consumers and utilities, but to several economical, desirable sub-sectors of the electricity industry as well. As noted, the green power market was among those hit hardest.

Perhaps the greatest tragedy in this whole story is that California was, during the early 1990s, the world leader in efficiency and renewable energy systems. According to the California Energy Commission, "in 1999, about 32.3 percent of the state's 259,365 gigawatt-hours of electricity production was produced by renewable sources ... By pursuing new generation technologies, California now has 40 percent of the world's geothermal power plants, 20 percent of the installed wind capacity, and 70-80 percent of the world's

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Efficiency is Still the Best Bet

EFFICIENCY IS STILL THE CHEAPEST, FASTEST, AND MOST rewarding part of the solution to California's energy crisis and the only answer that can help this year. The need for a concerted efficiency effort is obviously greatest and most immediate in California, but it is also important for the rest of the country. As RMI has reported and proved many times in the past, up to 75 percent of the electricity used in the United States today could be saved with energy efficiency measures that cost less than

the electricity itself.

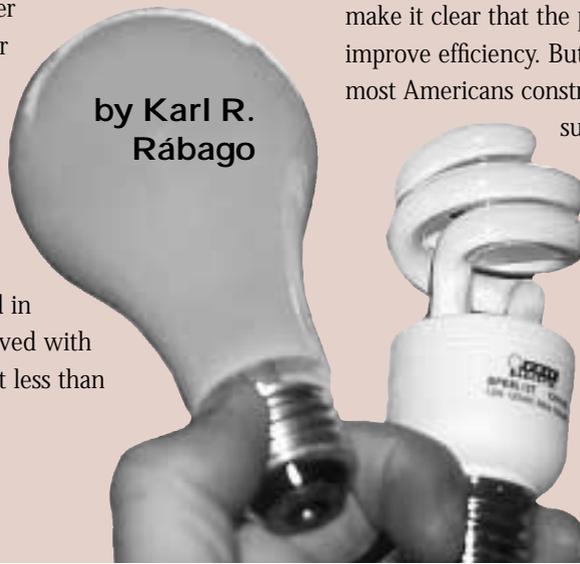
People want energy efficiency. Polls, surveys, and studies all make it clear that the public supports programs and measures to improve efficiency. But calls for energy "conservation"—which most Americans construe as voluntary sacrifice and

suffering—are a non-starter. Further, long-term efficiency gains will not be built merely on altruistic behavior.

The economic value of energy efficiency is huge. Only 10 percent of the energy that goes into the typical centralized power plant ends up as useful

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by Karl R.
Rábago



WITH THE CAPACITY TO MAP and manipulate the genome, humanity is entering a realm that offers great promise and challenge. It will force our species to make some of the most difficult decisions in history. To the extent that genome technology enables people to reshape themselves and other species, now and into future generations, in ways both intentional and unpredictable, it will have eternal consequences.

In a March 2001 cover article, *Time* magazine pointed out that in the face of genome technology “the meaning of what it is to be human ... will shift forever ... And as a result the conversation ... of how much man should mess with nature ... will drop onto every kitchen table, every pulpit, every politician’s desk. Our fierce national debates over such issues as abortion and euthanasia will seem tame and transparent.”

Time also quotes British futurist Patrick Dixon:

“Gene technology creates so many ethical issues that scientists are scared stiff of a public reaction if the end results of their research are known.”

Advocates claim that emerging genetic technologies promise to eradicate birth defects, cure debilitating diseases, supply endless transplant organs, extend human life, reduce human suffering, and ultimately, improve humanity and nature as a whole, while supporting strong economic growth in the process. Some even claim they will lead to the re-creation of dead loved ones and extinct species. Not since splitting the atom have we developed such a consequential technology.

Certainly, there are benefits. But others warn that much remains to be understood about genetic technologies—in regard to both promises and challenges. The genetic manipulation of agricultural crops was an indicator of how serious this issue will and should be.

Crop manipulation has already resulted in strongly polarized debates and street protests, and for good reason. Some experts are already anticipating “gene drift” as a result of experiments with genetically modified trees. In a July 2000 report, the American Lands Alliance warned that the drifting of novel bio-engineered genes into wild populations might allow genetically modified trees to out-compete native populations.



By L. Hunter Lovins and Walter Link

JOINING FORCES TO BROKER G E N O M E I N F O R M A T I O N

“The risk of genes escaping is particularly high when scientists are experimenting with native tree species—as is happening in the United States and Canada,” said Faith T. Campbell, Ph.D., director of American Lands’ Invasive Species Program and author of the report. “Wild relatives will be growing near any plantations of transgenic trees; if the plantations are not managed under very strict regulations, pollen or seeds will move out into the environment. No one knows what the impacts could be from such an ‘escape’.”

In December, the Environmental News Network reported that the U.S. Department of Agriculture “has issued more than 300 permits for trials of genetically engineered trees, and officials are expected to grant permission to grow the trees commercially by 2005.”

As people realize that genetic manipulation has already become a part of agriculture

and is rapidly moving into core aspects of human life, “conversations” about genome manipulation will become all-important. Whether these conversations are based on informed opinions and conducted with maturity will determine whether the outcome is constructive.

Recently, RMI accepted an invitation from the Global Academy to work together on these issues. The Global Academy is an organization that fosters economically successful, environmentally sound, and technologically responsible society through open, ongoing information exchange. In 2000, the Global Academy’s Genome Institute hosted a series of multi-stakeholder dialogues. These discussed issues ranging from transgenic crops to the human genome at several high-level international gatherings, including the Ibero-American Governmental Summit in Panama, a conference at the University of Peking in China, and at the State of the World Forum in New York.

RMI has agreed to work with the Global Academy to convene an ongoing series of such international dialogues on genome technology, publish the proceedings on the Internet, and disseminate diverse expert opinions on the cutting-edge issues of this

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RMI Hosts 'Indicators of Opportunity' Conference

SALES TAX REVENUES IN YOUR community are up, unemployment is down, and housing starts are clipping along at a brisk rate. Sounds like some basic and well-recognized ingredients are in place for a healthy economy.

But how is the rest of the community faring? Are people happy? Do they know their neighbors? Can they send their children out to play in safe neighborhoods? Can they walk or bike to work, or do they have an hour-long commute from their home in a homogeneous suburb?

And what about the environment in which the citizens live, and upon which the economy depends? Is the air clean, or does pollution trigger Red Alert days? Is there clean, free-flowing water for the commu-

nity to enjoy? Are native plants and animals assured of habitats in which to thrive?

Conventional economic indicators measure economic prosperity, but describe only part of the overall health of a community, state, or nation. A true measure of community prosperity includes many other elements of human, social, and environmental well-being.

Thus, many leaders have begun to devise new ways to understand where their communities are and where they are going. These new measures, called "sustainability indicators," describe a wide range of phenomena that are important to the people who live in the community. A sustainability indicator could be the number of salmon that made it to spawning grounds as compared to years past; the number of children

on federally-subsidized school lunches; or the average miles people have to commute to work each day. Each indicator is chosen to reflect an issue that is important to the health of a community.

Sustainability indicators are becoming an increasingly popular way to involve citizens in community planning and economic development. Indicators can point to negative trends that can be studied, understood, and dealt with before they become serious problems. Also, they can generate discussion among people with different viewpoints. And by providing decision-makers with critical feedback, they function as leverage points whose presence can change the behavior of a system. The most successful efforts link indicators with specific goals, policies, and action programs for

moving the community in a positive direction. (See sidebar, "Santa Monica's Sustainable City Program.")

In the last ten years, dozens of communities, states, and nations have begun to implement sustainability indicators initiatives. Some efforts generated thick, dust-collecting reports destined for the bowels of City Hall basements. Others, like Jacksonville, Florida's program, have gone a long ways towards raising public aware-

A clean and beautiful environment is an obvious indicator of an opportunity.



ness of sustainability issues. Still others, like an initiative in Santa Monica, for example, have been effective in using indicators to influence policy decisions. But even the Santa Monica program, long recognized as one of the country's most effective and robust, has not yet significantly influenced the diverse and disparate groups of citizens, businesses, and institutions that constitute the community.

Despite a great deal of activity and momentum, there is wide recognition among practitioners and experts that indicators must be better designed to support and drive decisions that improve the community's environment, economy, and society. As Randy Solomon, State campaign director of the Resource Renewal Institute says, "The indicators field needs more leadership and guidance in both the technical aspects of developing and implementing indicators projects and in developing a political strategy and a potent national voice for advancing the practice."

To address these issues, on May 2-4, 2001, Rocky Mountain Institute convened a group of 40 practitioners, policy experts, Internet entrepreneurs, methodology innovators, and systems modelers. Some had been working on this for years; others were new to indicators but were fascinated with the topic. The group came together to address the question, "How can indicators be used more successfully to influence decision-making and effect positive change?"

Group members shared their experiences of active community and state indicator projects and heard short presentations on new tools and approaches for measuring indicators and achieving sustainability goals.

Over a third of the workshop time was spent in small and large group discussions addressing questions of interest to the participants. At the end of the workshop the group identified seventeen topics for further research, and each person signed up

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One of Santa Monica's Big Blue Buses, which run on "clean" diesel (spewing less noxious emissions than regular diesel). The city is currently constructing a liquid natural gas facility at its bus yards and will soon begin converting the entire fleet to LNG. Photo: courtesy Dean Kubani

SANTA MONICA'S 'SUSTAINABLE CITY' PROGRAM

The City and citizens of Santa Monica used a collaborative approach to develop sustainability indicators, which were then linked to target goals and policies to be implemented by all city departments and offices. The City developed a "Sustainability Checklist" for purchasing decisions, a pilot alternative cleaning product program, and community education and promotional materials. The city has also created interdepartmental working groups that meet regularly to solve problems and come up with solutions and suggestions for achieving the target goals.

The City's indicators initiative has been successful. For example, in 1994, Santa Monica set a goal of increasing local bus ridership by 10 percent by the year 2000. By 1995, the City's indicators showed that rather than increasing, ridership had dropped by seven percent. The Transportation Department responded quickly by making numerous improvements based on input from more than 3,000 bus riders. Their efforts paid off. By 1998, ridership had increased by 9.5 percent above the baseline, and by 2000, ridership exceeded the baseline by more than 20 percent.

The City's vehicle fleet was another targeted area for improvement. The City set a goal of having 75 percent of the fleet operate on alternative fuels by the year 2000. In 1995, the City's indicator showed that only 15 percent of the fleet was alternatively fueled vehicles (AFVs). So under direction from City Council, the City staff devised a Vehicle Management Program—an integrated, whole-systems approach for vehicle retirement, procurement, and maintenance. By early 1999, alternatively fueled vehicles comprised 50 percent of the City's fleet, and by December 2000, the figure had reached 70 percent. The reason they didn't meet the 75 percent target was due to a lack of alternative fuel vehicles available for purchase.

The City has also drastically reduced its water consumption, and in July 1999 became the first U.S. city to power all of its facilities with 100 percent renewable electricity. Since that time, many other municipalities have followed suit. Santa Monica also boasts the world's first urban runoff facility that treats all the City's dry-weather urban runoff (runoff from car washing, excess lawn watering, *etc.*) before it is discharged into the ocean. ♻️

—Kate Parrot

Natural Capitalism and Kyoto

By L. Hunter Lovins,
Rick Heede and
Christopher Juniper

*Can natural capitalism substitute for the Kyoto Protocol? RMI isn't sure. Natural capitalism provides effective and profitable climate-change solutions for citizens and communities—and for the corporations that will make the greatest improvements. We believe in making markets work, partly through fixing the [perverse] market signals that businesses and consumers face. But even with widespread adoption of natural capitalism, would the world still need the fixed targets for reducing emissions and preserving nature's ability to absorb the requisite greenhouse gases of the Protocol? What do you think? Let us know at newsletter@rmi.org. The article below is one of RMI's monthly columns in the Japanese language journal *Nikkei Ecology* (July 2001 edition).*

WHEN THE WORLD'S LEADING countries faced up to the threat to the ozone layer from trace quantities of ozone-depleting compounds, they created the Montréal Protocol of 1987. Today's consensus appears to be that the problem is being solved, and that we will soon see a decline in ozone depleting compounds' atmospheric concentrations and a shrinking ozone hole. This year the southern ozone

hole started earlier, grew larger than ever, but also closed earlier.

Unfortunately, similar global efforts regarding climate change from excess greenhouse gases have not gained consensus and the framework for global agreement, the Kyoto Protocol, has been unceremoniously declared unworkable by the Bush Administration. Actually, only one industrial nation that signed the Protocol in 1997 has formally ratified it. The U.S., though not alone in its reluctance, remains the largest emitter. U.S. emissions of all greenhouse gases are up 11 percent since 1990, whereas we committed to reduce emissions by seven percent by the 2008–2012 period. With the White House eager to build hundreds of new fossil-fueled power plants over the next twenty years, time is running out.

Many nations have already implemented programs to move them towards compliance with the Kyoto goals. Several European nations realize the economic and social benefits of reducing emissions and have appropriate policies in place. The whole European Union expects to ratify the Kyoto Protocol by 2003.

Oversimplified, the Kyoto Protocol is a global agreement that sets national targets for reducing greenhouse gas emissions in this decade. However, mechanisms for suc-

cess are left to the nations. So far, these targets only apply to industrialized nations.

Arguments rage over how to count emissions, particularly credits for carbon sequestration by soils, trees, etc. Worse, in the U.S., opponents have successfully spread the myth that reducing CO₂ emissions is so costly it will bankrupt the U.S. economy.

Natural capitalism—as both a framework for action by organizations and a conceptual public policy—is the best way we know to end this argument. Its first principle, resource productivity, will solve most of the climate concerns and increase the bottom line of companies and countries.

Resource productivity, the core of any strategy to reduce greenhouse gas emissions, is a fundamentally sound strategy for greater prosperity, not less. Otherwise, why would market leaders like DuPont, STMicroelectronics, Ricoh, and many others be committed to reducing greenhouse gas emissions dramatically? DuPont proposes to reduce greenhouse gas emissions 65 percent from 1990 to 2010, as a way to increase shareholder value. ST's goal is zero net carbon by 2010. The most resource efficient organizations better survive general recessions and industry overcapacity—because their energy and materials costs per unit of product are lower. In good times, the same efficiencies translate to higher profits.

Natural capitalism, developed by RMI's Amory and Hunter Lovins and business author Paul Hawken, describes how organizations, communities, and nations can achieve those universal values of prosperity,

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Depth on the Bench

By Marty Pickett,
Executive Director

LIFE AT RMI

THIS FALL, RMI WILL CELEBRATE THE 25TH anniversary of Amory's "soft path" approach to energy use, distribution and creation. The celebrations will hold a special appeal for me because on my bookshelf at home is a dog-eared copy of Amory's book, *Soft Energy Paths*—required reading in my master's degree program some twenty years ago! How time flies, and that's the sentiment at RMI these days too. So much work to do in so little time. Whenever we think we're about to get our heads above water, something like the California electricity crisis comes along!

To make RMI more effective and viable over the next 25 years (when hopefully soft paths are more and more well traveled), RMI is rapidly changing the composition of its staff. Over the last two years, you've been hearing about the strengthening of our staff. Recently, we added yet another layer of seniority and expertise.

Last fall, Randi Lowenthal joined us as the Managing Director of operations of the Research & Consulting team. Randi's extensive experience in human resources, operations, and administration, from years of work with KPMG in New York, The Boston Consulting Group, and the law firm of Thacher, Proffitt and Wood are proving invaluable to RMI and me!

Our Research & Consulting bench has been greatly strengthened by the addition of Catherine Greener and Dr. Joel Swisher. Catherine, a graduate of Northwestern University with a B.S. in industrial engineering and an MBA from the University of Michigan, brings experience from a variety of positions in companies related to the auto industry, as well as a robotic systems supplier. She has manage-

rial experience in program development focusing on quality initiatives, most recently as Director of Customer Focus with ABB Flexible Automation. Joel holds a Ph.D. from Stanford in the Resources Planning Program, Civil Engineering Department, as well as a B.S. in Environmental Engineering and a M.S. in Thermosciences, also from Stanford. He is an internationally recognized expert and highly demanded consultant in utility rate design, energy efficiency, distributed generation, emissions reduction, and carbon offset projects and programs.

Another welcome addition to our staff is Steve Swanson, RMI's new Finance Director. Steve, a long time Roaring Fork Valley resident, brings over 20 years of experience in financial manage-

ment, including experience with businesses and non-profits, having served as the CFO of the Aspen Valley Hospital for many years.

As you can see, life at RMI is good indeed and our staff is growing with experience and leadership. I am more and more confident that the work of the Institute is in good hands for the future. ☺



Marty Pickett

NATURAL CAPITALISM AND KYOTO ▼

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health, and sufficient preservation of natural capital for future generations. It uses markets as tools to preserve our declining and infinitely valuable natural capital (such as a stable climate).

The four natural capitalism principles (see www.naturalcapitalism.org) are a whole-system approach that can guide organizations and communities towards profitable natural-capital preserving strategies and

investments. They help businesses and governments take their values from their customers, their designs from nature, and their discipline from the marketplace. In short, the principles drive an organization towards continual improvement of both environmental performance and profitability through radical resource productivity and elimination of waste.

If the Kyoto protocol is not ratified, natural capitalism will have an especially critical

role to play to reduce greenhouse emissions while increasing global competitiveness and enhancing prosperity.

There is no good reason to delay profitable actions or sound national economic strategies. Businesspeople worthy of their stock options aren't waiting around to see which country sets which emissions target or how fair it all is—they're just getting on with increasing their competitive advantage through energy and materials productivity.

In the Food and Beverage Industry A EUROPEAN PERSPECTIVE

by Richard Poynton

THE CONSEQUENCES OF THE depletion of the capital of Earth's resources, as a result of conventional business practices, are now becoming apparent in all parts of the globe. In Europe as well as America, global warming issues fill the headlines. The politics of emissions challenge national governments and the practicali-

For the food and beverage industry, the Earth's resources are an essential, if largely unrecognized part of its capital base. The depletion of natural raw materials (e.g., fish stocks) directly affects the availability and price of major food commodities. The diminishing capacity of the Earth's so-called "sinks" to absorb emissions and wastes is manifest in climate change and affects crop quality and seasonality and, through drought, some livestock. The Earth's dwindling ability to regenerate its renewable resources, such as soil and clean rain, affects crop yield and hence the availability and price of produce around the world.

Food and beverage manufacturing facilities use large amounts of energy for cooking, cooling, freezing, and cold storage and transport. They also use large quantities of water—as a product ingredient, as a heat transfer medium, and for cleaning and sanitizing food-related equipment. In Europe, utilities like water are becoming ever more costly. To compound the problem, the wastewater generated by food and beverage processing, though not normally toxic, is very polluting, and disposing of it is becoming ever more difficult and costly. Similarly, the options are closing down for the disposal of putrescible wastes, which in Europe have effectively been outlawed from landfills and which are increasingly denied the "return-to-farm" options of old.

Combined, these factors reduce operational flexibility and increase the base cost of doing business. This is bad news for business leaders, who are striving to

increase choice and reduce costs in order to raise business value.

In basic capitalist terms, what we are observing are the first symptoms of a challenge the entire business world will face: the consequences of depleted Earth resources. Although these gathering clouds are real enough, they should, in the author's view, be regarded the way author and professor John W. Gardner saw them, as "a series of great opportunities brilliantly disguised as insoluble problems." It is illustrative to apply the four principles of natural capitalism to highlight the underlying issues for the food and beverage sector and showcase some practical solutions to the problems of diminishing choice and rising cost.

RESOURCE PRODUCTIVITY

The chain of supply of food materials from farm to supermarket shelf has become longer and more complex. In the UK, "food mileage," the typical distance travelled by a food item from farm to shelf, has doubled in the last five years. At each stage in the chain there is loss and waste, both of which add to cost and fill the Earth's sinks.

Natural capitalism's principle of resource efficiency implies shorter chains. These eliminate some inherent waste by virtue of the closer physical links between the chain participants and by the reduced anonymity which fosters greater accountability. Accountability is an essential 'driver' for adopting resource efficient practices such as reusable plastic "tote bins" in place of disposable cardboard cartons. The temptation to favor



Richard Poynton

ties of waste disposal trouble many local authorities. Businesses are not immune to the situation. In Europe they face diminishing choice and rising cost, hindering their procurement of natural raw materials and their disposal of emissions and wastes.

Given its direct dependence on the Earth's resources, the food and beverage industry is among the first sectors to face these issues.

Natural capitalism, with its four principles, resource productivity, biomimicry, service and flow economy and reinvestment in natural capital, serves as a guide to the industry.

resource-intensive disposables, in order to make a “penny” on the side from their sale, is offset by accountability. Shorter chains also support more flexibility in logistics, reducing transport-related consumption—a major part of the food and beverage sector’s total use of resources.

The concept of resource efficiency forces us to question whether hauling out-of-season produce thousands of miles by air, rail, and road is the most sensible way of satisfying the demand for year-round variety in the taste, texture and color of our foods. Could our wit be better used developing crops capable of growing in local conditions through either conventional breeding techniques or sympathetically applied biotechnology? We’d save massive transportation inefficiencies and likely enjoy equivalent variety and delight.

Process design and operation in the food and beverage industry also offer ample scope for holistic thinking. Most process systems are designed around the concept of maximizing the efficiency, primarily in labor productivity terms, of the principal process unit (e.g., a spray dryer), rather than of optimizing the efficiency of the total system for making the dried product. Too little attention is paid to installation design and simplicity, resulting in the waste of energy, water, raw materials, product, cleaning fluids, human effort, and management time.

Currently, the industry’s “in-place” cleaning systems for pipework and plant rely on turbulent flow to scour away product deposits and to force sanitizing fluids into the nooks and crannies of poor design. The food and beverage industry is strongly wedded to the “thin pipes/large pumps” model of installation. Large amounts of energy are wasted by oversized pumps whose full capacity is needed only for the cleaning



Vegetable production under plastic in West England.
Photo: Cameron Burns

operation, which is usually only a small fraction of their daily running time. The author plans to explore the cleaning and sanitizing of food and beverage plants without recourse to turbulent flow, in order to unlock the energy and associated cost savings. Improvements in product quality should also accrue from this change.

BIOMIMICRY

To complement better procurement and leaner processing the food and beverage sector must also learn to think as Nature appears to do, in terms of closed reuse loops for its “secondary materials.” If we are to maximize our gains from the materials which we bring into the commercial cycle and reduce our generation of wastes and pollutants, we must convert our current linear, take-make-waste model of operation to a cyclic model that permits the reuse of partially exploited, “secondary” materials.

Mimicking nature in this way would dramatically reduce our total “take” of the

Earth’s raw materials and the impacts of our waste and pollution. In the context of food and beverage manufacture however, recycling presents the obvious dangers of concentrating chemical toxicity and of perpetuating the presence of pathogens in the food chain. In Europe, still heavily overshadowed by bovine spongiform encephalopathy (or “mad cow” disease) and its apparent risk to human health, such recycling is, currently at least, an almost universal anathema. Indeed, there are already voices within the European Parliament calling for legislation to separate “the waste chain” from “the food chain.” BSE is thought to have originated from a form, albeit seriously flawed, of the recycling which biomimicry invites us to contemplate.

Taking heart from John W. Gardner, our insoluble problem is perhaps a huge opportunity. At the beginning of the steam age, progress was hampered by the frequent and often fatal explosion of

CONTINUED ON PAGE 24

RMI's Hunter Lovins Preps UN for World Summit

Rocky Mountain Institute's Hunter Lovins was chosen as one of only four experts representing North America to guide the preparation of the United Nations 2002 World Summit on Sustainable Development.

In early June, Lovins participated in a "Regional Roundtable" in which UN officials gathered expert recommendations for promoting sustainable development. The proposals generated will guide heads of state from over one hundred UN member nations as they tackle development issues at a 2002 World Summit on Sustainable Development in Johannesburg.

"The overall goal of the Summit is to reinvigorate, at the highest political levels, the global commitment to sustainable development and to a North-South partnership," stated a United Nations invitation.

"We are looking to the Roundtable participants to provide . . . inspirational proposals to advance sustainable development in all regions of the world, as well as globally," wrote Nitin Desai, UN Under-Secretary General in an invitation to Lovins.

"The summit will be an important step towards improving the quality of life for people across nations in ways which will not compromise the ability of future generations to maintain and improve their conditions."

The 40-page paper that Hunter Lovins and Walter Link wrote to brief heads of state is now available on the RMI website, www.rmi.org/sitepages/pid178.asp.

Hypercar Center® Where Art Thou Now?

Remember that entity called the Hypercar Center®, set up in 1994 to research and promote the HypercarSM concept? As many of you know, most of that original crew went on to start Hypercar, Inc., and to develop and engineer its *Revolution* concept car (see Spring 2001 Newsletter). But what happened to the Center at RMI? Hypercar Center was how



Thammy Evans

RMI continued to promote the general Hypercar strategy even after the spinoff of Hypercar, Inc., but RMI had stopped work on the design. In December last year, RMI also decided to drop the name "Hypercar Center" for the promotion of its Hypercar vision—not least because it was confusing the general public about the difference between Hypercar, Inc. and the Center. RMI continues to promote its vision of a Hypercar future, and has taken on a new member of staff to do so. Thammy Evans concentrates on serving international press and public inquiries into the general Hypercar strategy, on fostering the adoption of the design concept in developing countries, and on researching public opinion of the Hypercar concept in order to better inform and educate the car-buying public. So although Hypercar, Inc. and RMI are taking complimentary paths to the Hypercar future, RMI is still firmly behind the vision and is committed to making it a reality. Watch this space for exciting reports on the global adoption of the Hypercar strategy!

'Philfest' Honors Phil Semmer

PhilFest—an all day festival of music and environmental discussion and awareness celebrating the life of



Phil Semmer

the late Philip Semmer—was held May 11 at Northwestern University's campus in Evanston, IL. Semmer, who died in an automobile accident in

Australia last year was between his last two years at NWU. He had hoped to work at RMI after graduation.

Philfest was created by Phil's friends, colleagues and acquaintances to celebrate his life. Proceeds from the event will benefit an internship at RMI in Phil's name.

"I was going to say, 'Phil would have loved this if he were here,' but I won't because Phil is here," Joan Semmer, Phil's mother, said to attendees in NWU's McCormick Auditorium. "Phil believed in the environment, he believed in helping others, but most of all he believed in unconditional love."

R.E.M. Helps RMI

In March, the popular rock band R.E.M. gave RMI a grant for \$5,000, dedicating it to RMI's work in Curitiba, Brazil.

In January, Dale Levy, RMI's Development Director, put in a call to Sarah Petit, the band's office manager. She said that although the number of requests the band receives has tripled in the last two years, RMI should still send a request for between \$3,000 and \$5,000 in February. We, and several million Curitiba residents, are grateful.

the Natural Capitalist

NEWSLETTER OF NATURAL CAPITALISM PRACTICE

VOLUME I #1 / SUMMER 2001

BRAZIL

NATURAL CAPITALISM FOR AN
UP-AND-COMING
ECONOMIC DYNAMO

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'Letter of the Month'*

By David Sanders
Payne

BRASIL. MENTION THE NAME AND LUSH, GREEN images spring to mind. Covering 8.5 million square kilometers and boasting a population of nearly 175 million, the world's fifth largest nation has recently become an economic dynamo. After two decades of stagnation

and massive debt, its economy is speeding up (GDP growth rate was about 1 percent in 1999, and it hovered around 4 percent over the four quarters in 2000).

At the cusp of this new economic era, Brazil's business and political leaders are only too aware of the potential for both manageable successes and intractable blunders. New ideas and applications in business, education, and policy are rapidly taking root in Brazil. *Capitalismo Natural*, the Portuguese version of *Natural Capitalism*, is being studied here for the alternatives it offers to the economic and ecological instabilities resulting from Latin America's historical development path.

José Luiz Alquéres, the former chairman of Brazil's state-owned power company Eletrobras, might have summed this up best when he observed to Amory Lovins: "Ten years ago, it would have been too early because we didn't have a real economy. Ten years from now, it would be too late because we'd have done too many of the wrong things. Right now is exactly the moment for these ideas to take root and transform Brazil's development path."



Curitiba's Botanical Gardens. Photo: Huston Eubank

RMI has long had links to Brazil. We were fortunate to become involved with one of Brazil's most advanced cities—Curitiba, the capital of Paraná state—during one of our own transformative experiences, the writing of *Natural Capitalism*.

Curitiba *is* different. A series of mayors, most of them architects, have worked to reverse the trends to which this and other Brazilian cities had fallen victim: poverty, disease, and unemployment. Using integrated design principles, akin to the whole-systems problem-solving model that frames natural capitalism, the city of Curitiba built itself into one of the most stunning examples of good urban planning in the world. Pedestrians reclaimed the streets. Shop owners were inundated with throngs of happy customers. Rows of children painting pictures stretched for blocks along malled streets. In *Hope, Human and Wild*, his follow-up to *The End of Nature*, author Bill McKibben chose Curitiba as one of three places on earth that provides a realistic and hopeful model for the future of our planet.

In the process of describing this reclaimed and rejuvenated city for *Natural Capitalism*, RMI's Amory and Hunter Lovins established relationships with leaders in Curitiba and across Brazil. Now, RMI has been called back to work with partners in business, government, and civil society, to extend and invigorate the "Curitiba miracle" to levels of performance not yet seen in Curitiba, but also, through the

With initial funding from the Summit and Overbrook Foundations, RMI is conducting design charrettes with corporate and government clients and developing a distance learning program to capitalize on what we see as a uniquely "teachable moment" in Brazil, and in the state of Paraná in particular. These are the first steps in a long-term effort.

GETTING DOWN TO WORK

Aware that a target as broad as Brazil's economic rise to prominence could consume the productive capacity of RMI's entire organization, we have chosen to begin with a few manageable projects in both the private and public sectors. By first achieving smaller successes with eager Brazilian partners, we hope to leverage the influence of natural capitalism across many disciplines later.

In March 2001, a contingent from RMI, in the form of ENSAR Group architect Greg Franta, RMI's Brazilian "Ambassador" João Antônio Prosdócimo, and RMI Associates Huston Eubank and David Payne, spent an intense two weeks together in Brazil. We found the people extremely accessible, welcoming, interesting, and interested. Here is a summary of some of RMI's extensive work on several projects in Curitiba:

WASTE WATER: ADVANCED WASTEWATER TREATMENT FOR THE STATE OF PARANÁ. In Summer 2000, the state water utility Sanepar hosted a presentation by Amory on natural capitalism and water efficiency at its Curitiba headquarters and a briefing at its field office in Foz do Iguaçu in western Paraná. In response to their request for implementation assistance, we are preparing an integrated sustainable design charrette on wastewater management, with these goals: to reduce energy and capital intensity of water treatment; to improve overall treatment capacity and performance; to clean up the rivers; to launch a decentralized biological waste treatment pilot project; and to develop a model for distributed biological waste treatment that can be implemented in the immigrant villages and favelas (slums).

RMI is working with the leading practitioner of this approach, Living Technologies, Inc., which designs, builds, and operates innovative wastewater treatment systems called "Living Machines" (www.oceanarks.org; see the Spring 2001 RMI Newsletter for an article on John

IN OUR WORK WITH OUR BRAZILIAN PARTNERS, WE WILL USE NATURAL CAPITALISM AS A FILTER THROUGH WHICH WE CAN VIEW, ASSESS, AND UNDERSTAND BRAZIL'S UNIQUE SUSTAINABILITY INITIATIVES.

power of example and the propagation of profitable and environmentally sound design principles, to affect the course of development across Brazil and beyond.

This is not a case of Northern "experts" imposing a solution on the South. Rather, in our work with our Brazilian partners, we will use natural capitalism as a filter through which we can view, assess, and under-



Inside the Curitiba MegaMall (Bourbon Group)—one hundred checkout aisles! Photo: Huston Eubank

stand Brazil's unique sustainability initiatives, and as a framework that can extend and invigorate them, and help to identify further opportunities.

Todd and “Living Machines”). As described in *Natural Capitalism*, Living Machines “eliminate the need for the chlorine, polymers, aluminum salts (alum), and the other chemicals used in conventional wastewater treatment plants. A biological treatment plant costs about the same or less to construct, especially for small-capacity systems. It yields valuable fertilizers and soil amendments instead of toxic chemical hazards, looks like a water garden, greenhouse, or wetland, doesn’t smell bad, and yields safer, higher-quality water.”

SCHOOL DESIGN: CURITIBA’S NEW SCHOOLS. With nearly 100 children born daily, Curitiba must spend 27 percent of its budget on education. Its 120-odd schools, many reused

... BRAZIL

CAPITALISMO NATURAL

We will then work with them to implement some of our recommendations in one of their existing schools. The results of this pilot will be put into a statewide guideline for construction of new schools.

SCHOOL CURRICULUM: GRADUATE ENGINEERING, TECHNOLOGY CURRICULUM AND DISTANCE LEARNING. Oberlin Professor David Orr, the leading proponent of integrating the environment and education, believes that changing the

procurement, design, and investments made by our educational systems represents “the foundation for a radically different curriculum than that presently offered virtually anywhere...;” Our work in school design is providing just this sort of “hidden curriculum” to schoolchildren. In addition, we are working with graduate programs such as CEFET (The Federal Center of Technological Education) to embed the lessons of sustainable design into design, engineering, and environmental management curriculum. We are also exploring web, email, and videoconference links via Paraná’s “Electronic University.” These academic distance learning initiatives will be integrated with the following business and public education ventures:

EXECUTIVE EDUCATION: DISTANCE LEARNING AND “ONLINE COMMUNITY BUILDING.” Amana-Key, co-sponsor of the Brazilian Portuguese version of *Natural Capitalism* (*Capitalismo Natural*), is one of Brazil’s leading executive training companies. Over the past 15 years, Amana has trained over six thousand top corporate managers at its campus retreat in São Paulo. The thrust of the program is “out-of-the-box” and innovative thinking. Sustainability is a core aspect of the program and a personal priority for Amana CEO Oscar Motomura. RMI will work with Amana to create original content, using digital technology to enhance and extend the highly effective and interpersonal programs that are underway at Amana.



In Curitiba, you don’t pay to get on the bus. You pay to get into the bus shelter—just like a subway platform at street level. Photo: Huston Eubank

for adult education at night, have achieved one of Brazil’s highest literacy rates. Yet many of these buildings are vestiges of a past era of design, embodying many of the inefficiencies that natural capitalism describes how to overcome. Representatives from the Curitiba municipal school system who attended Amory’s Summer 2000 seminar on natural capitalism expressed interest in working with RMI to construct model schools incorporating daylighting, energy efficiency, resource-efficient construction, air quality, and other green building qualities and techniques. We are currently analyzing Paraná’s prototypical school design and will present our findings this summer.

BROADCASTING: SATELLITE-BROADCAST EXECUTIVE LEARNING. DCom is a satellite television and web-based self-improvement, management, and strategy content provider. The leader in its field in Latin America—with 73 subscribers and 600 satellite receivers installed (ranging from North Florida to Patagonia)—DCom provides an excellent channel for disseminating sustainable design and business knowledge, and for highlighting natural capitalism. We are providing video presentations and case stories to DCom that will be subtitled in Portuguese and broadcast on its “strategy” channel and possibly on a future “sustainability” channel.

IN BRAZIL, RMITES IMPLEMENTING NATURAL CAPITALISM ARE ENGAGED IN TRANSFORMING THE COURSE OF SOUTH AMERICA'S ECONOMIC DYNAMO WHILE AT THE SAME TIME ENDEAVORING TO LEARN FROM BRAZIL.

other green development techniques was very positive. We expect that this growing relationship will yield a number of positive outcomes in the coming year.

TRANSPORTATION RESEARCH: HYPERCAR RESEARCH & DEVELOPMENT. While Curitiba's bus system is second to none in the world, Brazilians do like to drive (Brazilian Formula One racing outpaces America's NASCAR in its fanatic following). Small cars rule the streets and SUVs look like the dinosaurs they are—so what appeal does an “Explorer-class” Hypercar have in Brazil? Not much. Working with our partner at TECPAR (Paraná's research & technical institute),

Dr. Ricardo Torres, RMI will therefore promote the localization of Hypercar technology for the Brazilian market.

An appropriate Brazilian Hypercar industry could decrease by up to tenfold each of four key parameters of automobile manufacturing:

- The time it takes to turn a conceptual design into a new car on the street;
- The investment required for production (the main source of automakers' financial risk);
- The space and time needed for assembly;
- The number of parts in the autobody —perhaps even in the entire car.

Meanwhile, fuel would fall by about fivefold (and use by 100 percent) and materials use by about tenfold. Together, such advantages would make the Brazilian auto industry significantly leaner and cleaner.

LEARNING FROM THE SOUTH

All too often, North Americans try to foist ideas on our neighbors to the south. In Brazil, RMITes implementing natural capitalism are engaged in transforming the course of South America's economic dynamo while at the same time learning from Brazil's remarkable sustainable development innovations. We then hope to transfer that learning to a Northern Hemisphere in need of such ideas.



Curitiba cityscape. Note the dedicated busways. Photo: Huston Eubank

MALL DEVELOPMENT: SUSTAINABLE MALL DEVELOPMENT. For the last decade, malls have been one of the fastest-growing sectors in Brazilian real-estate development. In part, this building boom has been a response to historically high levels of violence and theft, so secure malls have become the community centers for many urban neighborhoods. In March we toured several malls and made presentations to members of Brazil's largest mall development company and its design team. A report commissioned by the US utility Pacific Gas & Electric documents a 40% increase in retail sales in well day-lit stores (such as Wal-Mart's experimental “Eco-Store” in Lawrence, Kansas). Brazilian developers' response to daylighting and

Since its inception, RMI has been innovating processes for

communities to foster greater prosperity and environmental responsibility. We continue to get requests (and kudos) for the *Economic Renewal Guidebook*, a guide for communities to discover how environment and prosperity go together rather than oppose each other. The *Guidebook's* focus is on how a community conducts its economic development strategy, a chief component of which is support for local businesses.

RMI's new business model based on natural capitalism principles presents new opportunities for economic devel-

NATCAP IN THE USA

HELPING GREEN BUSINESS PRACTICES GROW IN OHIO, OREGON AND COLORADO

By Christopher Juniper

net.org), supports 700 westside Cleveland manufacturers with technical, real-estate and workforce assistance. WIRE-Net's mission is to retain, grow, and attract industrial and related employers and to engage them as stakeholders in the community. Manufacturing Assistance Program leader Holly Harlan, a former General Electric engineer, was inspired by Co-CEO Amory Lovins's presentation to Cleveland's Green Building Coalition in April 2000 to integrate the natural capitalism model into WIRE-Net's pro-

grams. Supported by the Cleveland Foundation, Holly was able to help develop RMI's Tool Kit while introducing the model to client businesses and WIRE-Net decision-makers (two examples were described in the RMI Fall 2000 newsletter).

Harlan then introduced sustainability and natural capitalism to 27 local small-to-medium-sized business owners at WIRE-Net's November 2000 monthly forum. The leaders and strategic planners of WIRE-Net's manufacturing community were then invited to join a new Sustainability Learners Group of the WIRE-Net "Learners Group" process. Participants will meet once a month for nine months to define their ecological footprint, discover how natural capitalism can help them save money, show them ways

they can make more money using natural capitalism principles and help them implement the principles strategically.

To encourage sustainability in the metro Cleveland community, a group of leaders from non-profits whose missions are either economic development or environmental awareness are forming a collaboration—a community—to act as a catalyst for sustainability. Beginning in



Beer goes better with mushrooms, at least in the processing stages. Fermentation tanks at the Great Lakes Brewery in Cleveland. photo: courtesy Great Lakes Brewing

opment efforts to help businesses find prosperity through environmental responsibility. Such efforts are progressing in Cleveland, Ohio; Portland and Eugene, Oregon; and Colorado's Denver–Colorado Springs corridor.

NATURAL CAPITALISM IN CLEVELAND

Cleveland, Ohio's Westside Industrial Retention and Expansion Network, or WIRE-Net for short ([THE NATURAL CAPITALIST](http://www.wire-</p></div>
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December 2000, a new Entrepreneur Community for Sustainability emerged among twenty budding businessfolks. The results so far include plans to grow mushrooms profitably on spent brewery grains and coffee wastes and another project to perform a waste stream analysis for a neighborhood on Cleveland's East Side.

Though Harlan found that many businesses were doing individual pieces of the natural capitalism model, like resource productivity, for their own competitive reasons, she has fostered momentum towards a whole-system natural capitalism approach by working with small groups of early adopters.

Perhaps the city that was once known as the The Burning

PERHAPS THE CITY (CLEVELAND) THAT WAS ONCE KNOWN AS THE "THE BURNING RIVER" CITY MAY NOW BECOME A LEADER IN SUSTAINABILITY.

Portland Sustainability Commission has been advising City Council throughout the 90s, gradually increasing its collaboration with the City's business development efforts.

In January 2001, Commissioner Dan Saltzman led the City's adoption of the Leadership in Energy and Environmental Design (LEED) Standards for all City buildings and City-funded developments including business expansions financed by city funds, affordable housing loans and urban redevelopment projects. In addition, City operations bureaus will collaborate to develop a model for environmental lifecycle assessments that will guide capital project decision-making.

In April 2001, the City of Portland and Multnomah County adopted a joint plan to reduce county greenhouse gas emissions 26 percent by 2010 (10 percent below 1990 levels). In addition to activities addressing energy efficiency, transportation, renewable energy, solid waste and recycling, and tree planting, the new Local Action Plan on Global Warming emphasizes public outreach and education (see www.sustainableportland.org).

Strong local business community support for the City's efforts has been provided by the Northwest Earth Institute which organized the Oregon Natural Step Network of businesses and governments in 1997. In May 2001, Hunter Lovins and I presented natural capitalism principles to a three-day sustainable business practices conference. The Network has helped ten area companies begin the integration of sustainability concepts into business strategies (see www.ortns.org).



Dan Conway (left) one of the owners of Great Lakes Brewery and Pete Accorti, owner of Talan Products—a metal stamping shop, and President of WIRE-Net's board and co-founder of the Entrepreneur Group, at a recent Entrepreneurs for Sustainability meeting. photo: Holly Harlan

River City may now become a leader in sustainability.

NATURAL CAPITALISM IN PORTLAND

The City of Portland, Oregon added sustainable development concepts and actions to its economic development strategy in 1994 (spearheaded by Director of the Office of Sustainable Development and the author). The



RMI's Christopher Juniper



RMI's Jason Denner

NATURAL CAPITALISM IN EUGENE

In March 2001, Eugene, Oregon's Institute for Sustainable Ethics and Economics (ISEE) invited RMI to help kick off a community effort to begin sustainable economic development planning that includes hydrogen transition planning. RMI's Jason Denner introduced hydrogen characteristics/possibilities and planning concepts to over 50 representatives of local governments and nonprofits, and Paul Scott of Stuart Energy (www.stuartenergy.com), a provider of hydrogen appliances, reinforced that the time is now for communities to begin the planning process. I outlined sustainable community planning using natural capitalism principles. RMI hopes to partner with the City of Eugene and ISEE in the coming year to help develop the nation's first sustainable community plan.

NATURAL CAPITALISM IN COLORADO

Colorado's emerging sustainable business community development efforts are sponsored by the Catamount Institute (www.catamount.coloradocollege.edu), an environmental field school with a master plan that models sustainable design in Woodland Park (just west of Colorado Springs). Catamount's Sustainable Business Practice Group has collaborated with RMI to develop and produce three one-day conferences exploring natural capitalism and The Natural Step's system conditions. The conferences are forming the nucleus of a learning network of sustainable business practitioners and stakeholders. Catamount is also collaborating with the Center for Creative Leadership to explore the leadership training that is required for sustainable initiatives in business and then use this information to develop ecological leadership training seminars for business leaders. ■

NATCAP LETTER OF THE MONTH

Dear RMI;

Greetings from Tasmania, Australia. I'm on a benchmarking committee looking at sustainable development for our State (www.tastotogether.asn.au). I'm coming from The Natural Step way of thinking and I'm on my own at the moment! I'm looking for indicators that have been designed for Sustainability and am wondering if you guys can help me or tell me where else can I search?

*Thanks for your help,
Alison Pickering, Tasmania*

P.S. I bought Natural Capitalism before hearing Amory Lovins's talk in Hobart last year but have just ordered another copy due to popular demand among my circle of friends who won't give it back!

Alison,

As you'll read in this issue of our newsletter, I've been doing some indicators work recently. It sounds as though you're looking for general information at this point, and for that I'd recommend the following page on the RMI website: www.rmi.org/sitepages/-pid489.asp.

This site supports a recent workshop on the subject of indicators, held at RMI. In the library section you will find all sorts of documents related to indicators, and the links section will direct you to sites that will give you a general background on indicators as well as examples of communities that have implemented them.

Good luck, and let me know if you need any more information.

Kate Parrot

**Economic Renewal Program
Rocky Mountain Institute**

the Natural Capitalist

THE NATCAP NEWS

Hunter Lovins Wins LOHAS Award

RMI's Hunter Lovins this spring won the LOHAS Leadership in Business award for 2001.

The award recognizes individuals for their leadership roles in the business community concerned with the market sector known as "Lifestyles of Health and Sustainability," or LOHAS. The LOHAS awards were scheduled to be presented in late June at the fifth annual "Market Trends Conference." The conference is produced annually by Boulder-based Natural Business Communications, publisher of *Natural Business* and *The LOHAS Journal*.

Lovins, who kicked off the conference with a keynote address, was selected to receive the award for her overall contributions in the area of sustainability in business.

"We really want to honor outstanding pioneers in this area, for demonstrating leadership and advocacy in sustainability," said Steven Hoffman, managing partner for Natural Business Communications. Hoffman said the goal of the awards is to "applaud positive steps, keeping the pressure on corporations to adopt sustainable practices."

NatCap Wins Prestigious Award

Natural Capitalism has won the 2000–2001 Shingo Prize Research Award.

The prestigious Shingo Prize Research Awards recognize publications or software that broaden the body of knowledge in new theory and application of lean manufacturing practices. Shingo Prize Research Awards, administered by The College of Business, Utah State University, are given annually in conjunction with the Shingo Prize for Excellence in Manufacturing, which has been called the "Nobel Prize of manufacturing."

Describing *Natural Capitalism*, Shingo Prize officials noted: "This book extends many of today's lean manufacturing principles to the working of the world at large. Authors Lovins, Lovins and Hawken highlight the first Industrial Revolution, pointing out the relative scarcity of people during this era and how it limited progress toward exploiting a seemingly boundless natural world. Now, the

pattern of scarcity is reversed—abundant human resources, but increasingly scarce natural resources. The authors indicate that the next industrial revolution will use such resources much more productively through biologically inspired whole-system design."

NatCap Well Read on Many 'Hills'

Fans of *Natural Capitalism* are popping up everywhere. Recently, an influential political group added Nat Cap to its list of suggested reading.

"I'm delighted to report that the president and executive committee of REP (Republicans for Environmental Protection) America's Washington State Chapter recently bought copies of *Natural Capitalism* and presented them to all the GOP members of Washington's state legislature . . . with a similar message," Martha Marks, Ph.D., President of REP America, recently told RMI's Hunter Lovins.

"We at REP America agree with Congressman Sherwood Boehlert (R-New York) that the . . . book is first-rate," Marks added, "and we're telling everybody we know to get a copy and read it."

NatCap Author to Keynote Event

Amory Lovins, co-author of *Natural Capitalism* and RMI CEO (Research) will be a keynote speaker at the coming "The Century of the Environment—Resurgence Comes to America" event to be held September 6-9, 2001, in Rhinebeck, New York.

This three-day conference presented by OMEGA Institute for Holistic Studies will explore "the challenge of humanity entering the century of the environment. New contracts are needed between humans, nature, science, and society."

The conference brings together some of *Resurgence* Magazine's most celebrated contributors (including Jane Goodall, Peter Mathiessen, Lester Brown and many other notables) who share conversations on sustainability, and will "inspire in stunningly creative ways."

For more information, call: 800-944-1001; website: www.eomega.org.

CONTINUED FROM PAGE 4

solar electricity generation.”

Also hit hard was the state's leadership in saving energy. In the early 1980s, the Public Utilities Commission's established an incentive mechanism whereby utilities were rewarded for reducing consumers' bills rather than selling them kilowatt-hours. Such programs produced a huge glut of saved energy and huge profits for utilities' shareholders. The state's utilities were saving energy so fast that they projected that they would never again need to build a big power plant. Efficiency and distributed and renewable generation would have met the state's needs indefinitely. All told, California's world-class efficiency efforts saved 10,000 megawatts—a fifth of today's peak demand—and billions of dollars. What happened? (See “Efficiency is Still the Best Bet,” p. 4.)

In the 1990s, some of California's big industrial groups joined with some advocates of deregulation to enable those industries to buy their power from whoever had the lowest cost kilowatts. The resulting legislative catfight was settled by giving each of the warring parties the piece that mattered to them. And no one looked out for the public interest, or thought very hard about how the incentives that they were enshrining would actually function. In particular, the restructuring and ratemaking “reforms” took away the incentives that the utilities had to implement their efficiency and renewables programs, which had been lowering rates, and eliminating the need for more power plants. In their absence, and with steady demand growth, the disaster was predictable. What is needed is not a return to building big plants, which are far costlier than efficiency and renewables, and which take far longer to bring on line.

WHAT WE MIGHT HOPE FOR

A competitive energy services market, free to operate without barriers to entry or participation, is not only about letting the green folks in.

If done right, it would give customers the ability to react when faced with high prices. Customers could choose the makeup of their power, from efficiency to renewables to more conventional supplies. They could choose from a range of inventive services from diverse suppliers at rates we could barely begin to imagine. If the retail market is allowed to mature—and if regulators push their creativity and tenacity—energy customers could see a wide array of services that, while not new, are not available to the typical customer. Energy marketers could supply electricity with innovative rate structures such as flat monthly bills, time-of-use rates, incentives for reducing consumption during peak periods, community aggregation rates, shared savings rates, and many others.

In many recently deregulated industries (telecommunication, natural gas, financial services and others—all loosely described as having evolved into “commodity markets”) leading companies are providing integrated packages of services, most of which didn't exist even five years ago. In these industries, pure price competition is less important than creatively serving a customer. This is the benefit that a well-structured market can deliver, along with generally lower costs. But a structure that enables a few actors to shape the market for their private benefit, as occurred in California, is a far cry from a market.

Getting the system right is important for other reasons. The world of electricity generation and delivery is undergoing a profound transformation. New technologies for grid management, small-scale distributed generation, efficient end-use, and

energy storage all indicate that smaller generating facilities scattered throughout the grid (“distributed utilities”) are inevitable because they are the most cost-effective. Besides reliability, such technologies can save customers ten of billions of dollars, reduce the pollution associated with generating electricity and create tremendous business opportunities for companies at the forefront. But distributed generation will require more open and competitive markets that allow the introduction of these new technologies.

When the power of the Internet is combined with energy services, even more exciting options await. Already, large consumers in many parts of the country are using information technology applications that optimize the operation of large, energy-intensive machinery. In the not too distant future, you might even see intelligent systems balancing rooftop solar or basement fuel cell generator operation with household energy use. “The homeowner will be empowered as a utility of one,” notes Karl Rábago, RMI managing director and renowned energy expert.

CONTINUE MARKET DEVELOPMENT, PROMOTE DISTRIBUTED GENERATION, AND DEVELOP EFFECTIVE RULES FOR THE NEW ECONOMY

The generators successfully gamed California's system, but it was, according to the Federal Energy Regulatory Commission, entirely legal—California's new rules even encouraged it. Clearly, the laws governing industries like electricity need to be changed to get the outcome we want. The only laws that address issues like the California situation were written for another era entirely—the Public Utility

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HELP MY HOME PERFORM

Dear Rocky,

I've been reading your website a little at a time, scouting for ideas to improve my home's energy efficiency. Could you suggest some possibilities?

My home is about 1,400 sq. ft., heated and cooled, with an attached garage and covered porch on the south and west sides. I have lots of windows, which are mostly shaded by the porch in the front and trees in the back. My house faces south, has one tree in front but is shaded by a narrow strip of forest on the sides and back. I heat in the winter mostly with a wood burning stove, but supplement with a heat pump. The heat pump provides air conditioning in the summer, but I rarely use it.

I live in central Arkansas—weather varies from the lower teens in winter to 100+ in summer. High humidity in summer, and heavy storms in spring. You may also have heard of our ice storms this winter.

My current efforts to conserve energy include reduction: turning off lights, unplugging appliances which are seldom used, very low (60-degrees) thermostat in winter. In the summer, I catch water from the shower while it is warming up to use on plants. I use soaker hoses on the garden and heavy mulch. I have a water heater timer. My outer walls are 2x6's for greater insulation.

I plan to get a water heater blanket and check into low flow showerheads. I am interested in solar energy but can't afford any of the options I've seen so far.

Could you recommend some resources for me to investigate? I would truly like to be independent of the power grid and enjoy the homesteading lifestyle (though I'm not there yet). So what many would consider

"deprivation," I would probably consider logical.

Thanks for any help you can give.

Shannon Perna, Vilonia, AR

Dear Shannon,

Thank you for your interest in RMI and in improving your home's energy efficiency. It sounds like you are headed in the right direction: turning down the thermostat and turning off lights that aren't used provide significant gains. Beyond those measures, improving your insulation and the sealing of the house can provide significant comfort gains and savings particularly in Winter. Also, also check out the R-rating of the windows.

As far as getting off the "grid" it's probably not your best bet unless you have some financial support behind you. What we usually recommend is exploring attaching some photovoltaic panels onto the roof and then talking to your local power provider about putting excess electricity back into the grid (at a savings for you). This gets into real-time energy metering and might be beyond the current level of your utility, but many others are doing this around the country. RMI does this.

One other thought: order the book "Homemade Money" from our website, www.rmi.org. It was made specifically for folks retrofitting an existing home.

BROWNFIELD DEVELOPMENT CASE STUDIES?

Dear Rocky,

I am trying to find case studies on sustainable restoration and development of brownfields. Does RMI have any such studies in its literature that I can purchase/use/download? Or could you kindly direct me to a source for such a study?

Thanks for any assistance.

Mary Loquvam, via email



by
**Ben
Shepherd,**
RMI
Outreach
Associate

Mary,

RMI's Green Development Services is involved in a number of brownfield and redevelopment projects. The Denver's old Stapleton Airport is one. Our *Green Development* CD-ROM also contains a number of case studies of redevelopments as well as the latest in building technology. (You can order from our website, www.rmi.org). Check out:

- The EPA, as it is the major funders of most redevelopments. Their brownfields home page is: <http://www.epa.gov/swerosps/bf/>.
- A good brownfield non-profit is: <http://www.brownfieldsnet.org/>.
- A recent report published by the California Center for Land Recycling "Brownfield Redevelopment Case Studies" regarding specific projects within the State of California. Contact the Center at: (415) 820-2080.

SEEING THE LIGHT WITH WINDOWS

Dear Rocky,

Just got the Spring 2001 Solutions. That's a great article on efficiency versus drilling. You folks hit the central point of a central issue.

Question: right at the very last sentence where you break from page 3 to page 20 you say "with superwindows, like the 1983 models that have let us..." referring to your own building. Here in Newton we are retrofitting our two high schools. I have a copy of the United States Green Building Council LEEDS system and I am

attending *Building Power at Tufts* in a couple weeks. Although not a building systems engineer (I am an entomologist of all things), I am trying to inform myself fast. I was recently appointed to the Newton Energy Commission representing the schools so I am now in a position to actually have some input. But I need tools.

Give me some detail on your windows. Please—note that I am not asking for you to hold my hand here, just “clearinghouse me” with some information. Send me towards the next resource. For example, referring me to one company or organization that understands how to make/evaluate energy efficient windows would be fantastic.

Dr. Eric Olson, Ph.D., West Newton, MA

Dear Eric,

Glad you enjoyed the 2001 Spring Newsletter. With regard to your question, RMI's Main Building uses mostly Heat Mirror windows which consist of two separate glass panes that have a coated film and inert gas between them. The system traps more heat while preventing most ultraviolet and infrared light from entering the building.

For more information contact:

Heat Mirror

Insulating glass with coated film and inert gas inside.

800-882-4466

www.alpeninc.com

Low-E

Soft coat, low e glazing.

800-843-1484

Superglass

Southwall Technologies

800-365-8794

www.southwall.com



POWER TRIP ▼

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Holding Company Act and the Federal power Act, for example, was enacted in 1935. RMI managing director Tom Feiler likes to describe California's restructuring as “conceptualized by the politicians, crafted by the utilities, dressed up by consultants and academics to look like respectable economics, shopped to the special interests, and then sold to the public.” Unfortunately, the public didn't get the chance to tell the seller it didn't like the product.

Ultimately, public policy and regulation should encourage innovation and development of least-cost solutions and reduce the environmental and social costs of generating electricity. Policy makers in Sacramento and Washington, D.C. need to properly analyze California's mistakes, understand why they occurred, and start establishing a market structure that will not founder a second time.

Building more power plants might seem the simplest option for California and the rest of the country, and as a result of recent energy concerns, orders have been placed for more than 90,000 megawatts of new power plants (that's 90 Chernobyl-sized plants). But large centralized power plants were never a good answer for the energy needs that we have, and they are a very poor financial investment in light of the rapid technological transformation taking place in the industry.

The now famous Power Exchange is virtually closed. In February, it shut its “day ahead,” and “day of” spot markets and it now has a skeleton staff trading long-term contracts. Most of the workers were laid off and the PX is in the midst of several big lawsuits—less than three years after it opened. The state is taking over as the entity buying and distributing electricity. How successful it will be remains to be seen.

One thing is undeniable, however: there are valuable lessons emerging from the meteoric rise and fall of the California electricity restructuring experiment and that strange little office in Alhambra. The entire nation is in a state of bewilderment and trepidation over what happened in California. It would be a terrific shame if California's bungled experiment eclipsed other states' abilities to tap into the tremendous benefits available from properly structured well-organized markets.

—By RMI Staff (Cameron Burns with Hunter Lovins, Karl R. Rábago and Tom Feiler)

Dear RMI Readers and Supporters,

As you've likely read, we are now asking for a \$20 donation in return for an annual subscription to our newsletter (three issues). You can read the newsletter online anytime at www.rmi.org without a subscription. However, if you enjoy it, we hope you'll contribute anyway.

Also, we apologize if you received your copy of *RMI Solutions* at the wrong address, or if you requested an e-mail notification and instead received a hard copy in the mail. Please if you would like changes made in your mailing address or in how you receive RMI information, contact Ruth Klock at 970-927-3807, or e-mail her at ruth@rmi.org.

Thank you for your patience with our evolving process.

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steam boilers. This problem was overcome by better technology, by better regulation, and most importantly by the will to combine both to unlock the benefits of steam safely.

What if we developed the technical means to adequately control the risks arising from the use of “secondary materials” in food and beverage manufacture? If we have the will, this could perhaps be done by developing truly effective regulation along with protocols such as the Hazard Analysis Critical Control Points (HACCP), already established to secure the safety of some food products. If adequate control of “secondary materials” risks could be achieved in the food and beverage industry, a foundation of sound practice would be established upon which to build the wider adoption of biomimicry in other sectors.

SERVICE & FLOW ECONOMY

As a major user of utilities, the food and beverage sector offers many opportunities to adopt a service and flow approach to its operations. Conventionally, utilities (water, electricity, etc.) are purchased as commodities, rather than as “utility services.” With water this generates a double charge to the user when he buys the water and then when he pays for the wastewater treatment service. Obviously, there’s an incentive for the water supplier to maximize the sale of both, at great cost to the customer and to the Earth.

In the UK, the food and beverage sector is in the vanguard of changing this system to one in which the utilities supplier provides a “water benefits service.” This means that both the cost of the water and of wastewater treatment switch from the revenue to the cost side of the utility provider’s accounts, encouraging efficiency. UK utility

companies are now beginning to work with their food and beverage customers to find ways in which both parties can make savings and share benefits.

A similar approach could be taken with each of the other utilities. With both compressed air and refrigeration there is the opportunity for the smart utility company to capture the waste heat from the compressors and add it to his portfolio of available customer benefits.

Such non-utility items as transport and transit packaging are already “outsourced” to a substantial degree in the European food and beverage industry. The missing link here is the feedback of data to enable the food company to manage its use of these services per dollar of turnover. This link will have to be forged if businesses are to measure and maximize the benefits of switching to service and flow.

REINVESTING IN NATURAL CAPITAL

Reinvestment by the food and beverage industry is at a very early stage and is focused on preventing further decline, rather than on restoration. Nevertheless, many organizations have drawn support for a scheme to identify and differentiate products’ origins. The new Marine Stewardship Council (MSC), for example, identifies fish from “sustainable fisheries.” It is hoped that this investment will support the reversing of the decline in fish stocks.

Given the scale on which the food and beverage industry uses energy, there is an obvious case for investment in renewables and in the Earth’s sinks for carbon dioxide. One small but promising beginning is the investment by a major UK supermarket in wind power for a distribution depot and in

a “minimum energy” design for a large store. This store can be retrofitted with solar panels once solar power becomes more economical. The same company is experimenting with the use of solar panels to power the chillers on its 3°C truck trailers.

As concern mounts about the loss of fertile soil, it is likely that this problem will also attract investment sponsored by the food and beverage sector. There are already some investments in the sustainable provision of accommodation, education and welfare for farm workers in third world countries. Because the benefits from such welfare investments depend directly on the health of the land itself, it is possible they may lead to complementary investment to reverse the depletion of fertile soil.

As the consequences of the depletion of the Earth’s resources begin to bite, the food and beverage industry in Europe is swallowing hard and beginning to stem the erosion of its natural capital base. Its motive is commercial self-interest, but with the vision to see the problems as opportunities and the will to grasp these opportunities, the result should be a move towards the practice and benefits of a more tasteful capitalism. 

Richard Poynton is the founding director of Business Benefits Ltd., an independent consultancy advising on the business opportunities of sustainability in the food and beverage industry. He regularly uses Natural Capitalism principles in his work. Richard is based in Surrey, UK, and recently took part in a sustainability charrette RMI created for cidemaker HP Bulmer Ltd., of Hereford, England.

EFFICIENCY IS STILL THE BEST BET ▼

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work. That means every unit of efficiency applied to power generation equates to 10 units of fuel savings at a typical coal plant. This kind of payback dramatically exceeds any benefits gained by improving big power plant efficiencies by a few percentage

points.

Unfortunately, the economic benefits of efficiency have never been properly portrayed in America via any medium. They are instead obscured by a system that sells us electricity based on average prices, fails to

differentiate production costs at various times of the day and year, meters our usage on devices few can read, and sends us a signal only once each month in the form of a bill. In fact, the incentives often flow in entirely the wrong direction for utilities as well. The California mess is due, in part, to a system that gave utilities a strong incentive to sell more electricity and that threw away decades of utility experience in helping customers save energy.

RMI Proposes:

- **Rethink restructuring.** Efficiency programs shouldn't be put in the hands of utilities if they retain an incentive to sell more electricity. Government also has an important role to play in creating markets that set the proper incentives.

- **Improve education and awareness** about efficiency for customers, regulators, and policy makers. Lack of basic understanding about the benefits of efficiency is a key barrier to its greater use. RMI devotes a great deal of effort to this education, but more voices need to join in the chorus.

The technology and experience for great jumps in efficiency already exist. As a sophisticated society we know how to create incentive schemes, efficiency programs, and competitive markets. We have done all that before. We can and should do it again, for California and the rest of our country. The value of energy efficiency is greater than it has ever been—especially when natural gas prices go up. It empowers customers to take control of their own energy use and budgets and it delivers scores of other benefits (such as environmental benefits) for free.

With efficiency, if we build it right, they will come ... running. 

RMI ON THE ENERGY PLAN ▼

CONTINUED FROM PAGE 1

services by using fewer resources more productively. It applies smarter technologies to eliminate waste, based on the attitude, 'Do the same (or more and better) with less.'

We genuinely like the fact that the Bush Administration's new energy plan contains words like *efficiency*, *clean energy*, *market forces*, *long view*, and *least cost*.

However, action reveals true intention. The administration's budget proposal cuts \$278 million from renewables and efficiency R&D while adding \$2 billion for coal. If that is what the Bush Administration intends with the plan, then America's in trouble.

The details of the plan are being enthusiastically dissected, and more revelations will emerge, but it's important to examine some of the big themes that underlie the plan.

- **Market forces or not?** The plan asserts support for market forces, but aggressively promotes the mature coal industry and the uneconomic nuclear power industry with massive fiscal and policy subsidies. This isn't market action; it's the very worst aspect of big government and big business acting in collusion. Demand and supply are both active sides of a dynamic economic process. But much of the Plan falls into the old big-government approach of forecasting demand, then using government subsidies to build supply to meet it.

- **Energy impact assessment.** Energy already shows up in cost and benefit analyses that accompany all government actions. It is not clear why the Administration wants to call out energy issues above all others with its proposed energy impact assessment. However, if the intention is to elevate the Administration's views of the importance of energy supply above all other issues, it would be inconsistent with statements that energy and environment, for example, are not competing priorities. And if it is government-speak for stacking the deck in favor of supply-side initiatives like proposed oil drilling in the Arctic National Wildlife Refuge (the energy impact "outweighs" competing issues), then it is simply bad policy. (See Spring newsletter.)

- **Energy and the environment.** RMI wrote the book on how energy, development, environment and economy can be balanced successfully. It is called *Natural Capitalism*. We are glad to hear Mr. Bush understands the balance. But we have to ask

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INDICATORS OF OPPORTUNITY ▼

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for one or more working groups. Some of these included:

- Developing an indicators curriculum for higher education;
- Addressing the nexus between community/state/national sustainability indicators and those being developed for business (e.g. the Global Reporting Initiative);
- Becoming more personally effective in translating indicators to action.

Participants also brainstormed many ideas for continuing the workshop discussions and moving the field of indicators forward. An international conference on indicators was debated and deemed by most participants to be a worthwhile endeavor.

One workshop discussion group proposed the creation of a National Leadership Working Group on Sustainable Development Indicators to be composed of twenty to thirty practitioners, experts and promoters of sustainable development indicators. The group would provide leadership on addressing important political and strategic questions related to indicators work, methods for standardization, and research on technical indicator questions. The group would also serve as a stable and accessible peer review and information source for practitioners all over the country.

One participant has started an Internet indicators discussion group, and many participants are talking amongst themselves about future collaboration. In fact, the group said one of the most valuable things about the workshop was the networking, and meeting people they'd heard about for years, or had been corresponding by email but had never met.

David Swain from the Jacksonville

Community Council noted, "Rarely do I have the opportunity to think and plan with such an exciting group of thinkers and activists. Rocky Mountain Institute is to be commended for convening such a powerful group for such an important purpose."

Beth Vaughan from the Resource Renewal Institute said, "I appreciated the opportunity to meet such a great group of people and to take two days out to really think about sustainability issues. Already I've followed up on the numerous contacts I made and am looking forward to collaborating on a few projects with key people."

And as one might expect from such a spirited, creative crowd, there was ample fun and lightheartedness, both during and after the workshop. On Thursday May 3, 24 inches of heavy, wet white stuff fell in a late spring snowstorm. During one break, several people were caught lobbing snowballs at one another and at the hapless discussion group one floor below. That night after dinner, Alan Atkisson and David Berry played guitar and sang for the group in the

fireside lounge of the Snowmass Club. And there was time to see the RMI main building and do a walking tour of downtown Aspen before dinner Friday night.

Overall, the group agreed that this was an exciting and worthwhile gathering. With some diligent follow-up and follow-through, the RMI Indicators Workshop could be the start of valuable and sustained collaborations for designing indicators projects that influence decision-making and effect positive change.

Author's note: In recent news, the Hewlett Foundation has provided a grant of \$50k to support the development of the International Sustainability Indicators Network (ISIN), which will connect practitioners and researchers, both individuals and organizational entities, involved in using indicators and indicator-related tools to develop more sustainable communities, businesses, and other organizations. 

RMI ON THE BUSH ENERGY PLAN ▼

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why Mr. Bush, Mr. Cheney, and the entire administration emphasize the energy supply options with the greatest environmental burden. Optimizing multiple benefits means balanced reliance on the full range of resources—not just picking a supply-side solution and then seeking to reduce its inevitable, unnecessary environmental impacts.

- **The Bucket Has Holes.** It would be best to plug the energy leaks in our society and our economy—at least the very big ones—before calculating how much energy it takes to fill it. First things first. Establishing priorities is essential. The problem with the report is that it lacks any priority, or worse, promotes expensive reactionary measures instead of economical preventative measures.

At the end of the day, any national strategy is about public policy choices. The consequences are large, wide and far-reaching. Mr. Bush should offer a plan that emphasizes clarity, not one that appears to say everything but really only advocates action on the supply side. 

—By **Karl R. Rábago and Cameron M. Burns**

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technology. The Global Academy and RMI will offer a neutral forum, bringing together leading thinkers and practitioners in these and other fields. RMI's Hunter and Amory Lovins will, with Global Academy's Walter Link, co-chair the international advisory board, and will together direct the work of the Genome Institute.

This year, that work includes creation of a program for the international Scientific and Medical Network Annual Dialogue in London; co-sponsorship of a dialogue program on Genetic Science and Humanity in Paris, held at UNESCO; participating in a discussion of genetics issues pertinent to indigenous peoples, particularly Native Americans; and another visit to Latin America to host a dialogue on genome technology for the celebration honoring the 50-year anniversary of the University of Panama. It will also include the creation of a website that will post the proceedings of the various meetings, and will host discussions of the issues between experts and the public.

The Genome Institute is also exploring future events in Africa, Europe and Asia, as well as events at universities like Columbia and Harvard.

Around the world, gene manipulation technology is advancing quickly. Public policy is struggling to keep up. Lagging far behind is public understanding.

The Global Academy Genome Institute will make diverse perspectives and information available to enable the general public and decision-makers to gain a deeper, more balanced understanding of the core issues of genome technology. Providing the basis for informed decision-making should lead to wiser decisions in what may be humanity's most consequential endeavor. 

Bob Campbell

RMI BOARD MEMBER



Some might think it paradoxical that a retired big oil CEO would join the vanguard of resource conservation, but to Bob Campbell, it makes perfect sense.

After serving as Chairman and CEO of Sunoco from 1992 until June 2000, Campbell and his wife Nancy settled in Snowmass Village and became one of RMI's high country neighbors. After re-activating a long-standing friendship with RMI co-founder Amory Lovins, Campbell agreed to serve as an RMI director, and more recently, as a member of Hypercar, Inc.'s board.

"I've been in the energy industry for my whole 40-year career," Campbell said. "I never did believe that the solution to our energy problems would be drilling more holes."

Campbell explained that for him, structural efficiency—the building of new energy efficient technologies into products consumers want—is the future.

"I'm interested in efficiency designed into new products, not Jimmy Carter's approach of making do with existing technology by turning down the heat and putting on a sweater," Campbell said.

Campbell first met Lovins in the early 1980s at an energy industry conference. "I admired Amory's intellect and what he had to say," Campbell said.

Campbell said all the environmentalists he had met up till then appeared to view capitalism as the "heart of evil." Lovins's approach of harnessing industry's capital and intellectual resources to move it toward efficiency made much more sense.

Campbell also joined the Hypercar, Inc. board of directors because he wants to help get Hypercar technology on the street as soon as possible. The Basalt-based RMI spin-off has redesigned the automobile from the ground up.

Hypercar innovations such as a carbon fiber composite body and fuel-cells propulsion could achieve a five-fold increase in fuel economy.

"If we wait for Hypercars from the auto or oil industry, it will never happen," Campbell said. "Hypercar, Inc. is the right thing to do."

—Bernie Grauer

Remembering Eric Konheim

On June 12, ten years ago, an athletic young man named Eric Konheim died while surf kayaking alone off Bastendorf Beach, Coos County, Oregon. This summer, the eighth intern working toward Eric's vision of a sustainable world will become a part of RMI, as the newest Eric Konheim Memorial Fellow. The world is full of wonderful, unique, and surprising connections, and Eric Konheim's connection to us here at RMI would be best described as all three.



Eric Konheim

Eric Konheim was just a few days shy of his 28th birthday when he died. He was not old, but his life's path had already been laid out before him: adventure in the heart of the natural world combined with a deep concern for our activities in the human world.

"Eric had a deep and abiding concern for the Earth's natural resources," his father,

Bud Konheim, wrote. "For his senior thesis, he performed a thorough investigation of the best ecological, environmental, and business use of an existing railroad yard in New York City. From time to time he would drop in after work and we would tour my office. Examining trash baskets, Eric would comment about the environmental awareness (or lack thereof) demonstrated by the staff. He would always drop off the latest information on recycling to make sure he could be proud of my environmental efforts. He was never quite satisfied that I was doing enough. He was never quite satisfied that anyone was doing enough, including himself."

It was dedication to cutting edge adventure that eventually took Eric's life on that Oregon coast a decade ago, but his vision lives on today at RMI. Back when he was only 27 years old he wrote a will leaving his material assets to the Institute. He had visited briefly in 1988, while researching water efficiency measures to help save wild and scenic rivers, and thought RMI was worth his investment, even posthumously.

As an architectural student at Hampshire College, Eric developed incentives for cluster housing and commercial centers. His commitment was born out of his keen observations, as a nine-year-old,

of the effect of shopping malls invading Long Island's open spaces. Another of Eric's architectural projects was an underground nature center, which included many elements of Rocky Mountain Institute's resource-saving design.

"Eric was righteous," his mother Carolyn recently recalled. "He had a caring soul and always looked out for the disadvantaged. He would take poor kids camping and on outdoor adventures because he knew they'd had little experience with nature. He was always learning, listening to others. He would work three months, then travel and meet people for three months. What would he be doing if he were alive today? Eric would probably be involved in environmental entrepreneurship. It just seemed natural for there to be a way to remember his spirit and soul and RMI seemed to be the best place, the best kind of endeavor."

After Eric's death, the Eric Konheim Memorial Fellowship was established by his family to support one intern at RMI each year in our Green Development Services department. The Fund's first fellow was Brian Henry Cuff in 1993. Brian was followed by Guy Harrington, in 1994, Tanya Chan in 1995, Swapna Sundaram in 1996, Gregg Osofsky in 1997, Christopher Trevisani in 1998, Michael Finch in 1999, and CC Gil in 2000. Although they have now scattered to all corners of the globe, each of these remarkable individuals has gone on to contribute a part of Eric's vision of a more sustainable humanity.

"Since my wonderful Konheim Fellowship experience, I received a Masters in Architecture from UCLA in 1998, and worked in Los Angeles for John Picard at E2, Inc.," said Tanya Chan. "I had been helping John Picard design and build his new, high-tech eco-house, which is currently under construction. In 2000, I moved to New York City to work for Maya Lin, who is an artist/architect well known for designing the Vietnam Memorial in Washington, DC.

"Recently, I joined an architecture firm in New York City called Polshek Partnership, LLP," Tanya said. "The Konheim Fellowship gave me great exposure to green architecture and development. Research for Green Development really allowed me to see how innovative, intelligent and inspirational sustainable and green architecture/development can be.

"The Konheim Fellowship was important to my professional development," said Michael Finch, who completed his MIT master's thesis while the Konheim Fellow at RMI. "It enabled me to be a part of Institute's pioneering work in green development and at the same time supported my research on the financial implications of environmentally considerate design and development."

This year's Konheim Fellow is Lauren Yarmuth, a graduate of San Francisco State University and the Rhode Island School of Design. We welcome her in joining Eric's vision. 

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LETTERS TO THE EDITOR

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ABOUT THE INSTITUTE

Rocky Mountain Institute is an entrepreneurial nonprofit organization that fosters the efficient and restorative use of resources to create a more secure, prosperous, and life-sustaining world.

Our staff shows 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.

Our sincere appreciation is offered to these friends who have contributed to RMI between January 1 and April 30, 2001. Numbers in parentheses indicate multiple donations by our frequent givers. 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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Back in December, a couple living in Colorado sent a

contribution to RMI. On the reply envelope, one of them wrote, "Please send information on how to make RMI our testamentary beneficiary." We sent them a brochure entitled "What You've Always Wanted To Know About Wills" and a letter in which we suggested wording for several of the possibilities outlined in the brochure.

I'm sharing these ideas with you because they might be helpful to some of you in your estate planning. A number of different options exist for making a contribution in your will. In each case, your attorney can help you with the wording.



A Hearty Thanks To All Dale Levy, Development Director

Ways to leave a bequest to RMI include: 1) designating a specified percentage of your estate to the Institute; 2) naming a specific, fixed amount of money for your bequest; 3) leaving specific property to the Institute, such as real estate, stocks, or perhaps a collection of books; 4) including a residual bequest. In this instance, after all your specific bequests have been fulfilled and all heirs have been provided for, any remaining amount is left to RMI. Sample wording might read: I hereby leave (a percentage, a specific amount, etc.) to Rocky Mountain Institute, a Colorado nonprofit corporation, whose purpose is to foster the

efficient and restorative use of resources to create a more secure, prosperous, and life-sustaining world.

After reading the brochure and letter and visiting with their attorney and an RMI staff member, the couple above decided to include a bequest to RMI in their will. If you would like to receive a copy of the brochure, or if you have questions about how to include RMI in your will, please contact me at 970-927-3851 or email me at dalelevy@rmi.org. Our postal address is 1739 Snowmass Creek Road, Snowmass, CO 81654. Thank you! 

staff spotlight: Ethel Lossing

Unknown to many supporters and associates, there are a few internal subcultures at RMI—the outdoorsy folks, the horse people (several managers are enthusiastic polocrosse players), and, of course, the artists. RMI's facilities manager Ethel Lossing stands squarely in the third group—she's a heck of a singer, but she also rides and loves the Great Outdoors.

Ethel grew up in Chappaqua, New York. The daughter of an opera singer and a management consultant with a doctorate in psychology; her entire early life revolved around music. Piano, violin, and viola lessons were followed by guitar, folk singing and an ongoing interest in performance. "Performing is about being totally in the present," she says. "Everything else goes away. It's a great release."

After high school, Ethel followed her own path ("left as soon as I could") out of suburbia, and found herself drawn to a series of interesting places: Putney, Vermont; Cape Cod; Nashville; and finally, in 1984, to El Jebel, Colo. In each place, seasonal performance gigs were offset with more down-to-earth careers (bartending, waiting tables, housecleaning, first mate on a pleasure fishing boat, and many centered around the "cowboy" lifestyle.) After her first winter, managing the kitchen of a ski-in, ski-out restaurant at Snowmass Ski Area, Ethel found summer work as a hunting camp cook, up the nearby Fryingpan River Valley. At

night, sitting near a campfire under the stars, Ethel found her voice in high demand, and she began her now famous career as a hunting camp musician, belting out classic old cowboy songs into the moonlit Rocky Mountain nights. Occasionally young RMIites overhear a few good "Ethel" stories about those days.

Entertaining gave way to some entrepreneurial activities in the late 1980s. Ethel ran a lawn care and gardening business for five years, before trying her hand in a café that became a financial albatross ("never do it with a partner," she quips.)

The local business community's loss was RMI's gain. Ethel came onboard answering phones in 1994 and over the next seven years worked her way up to overseeing RMI's facilities and its staff.

One night, singing around a high country campfire she told her friend Hunter, "I'm going to start my own country band."

"Sure you are," a skeptical Hunter replied.

Within weeks, Ethel had assembled, "Rodeo Cool," a band that has proved both popular and enduring.

If you're lucky enough to catch one of Ethel's shows, expect a little nostalgia and a lot of energy. "I like the old time stuff," she says, "the classics in country, jazz, and swing." 



THE FOLLOWING EULOGY WAS DELIVERED AT A TRIBUTE TO DANA MEADOWS ON EARTH DAY, PALACE OF FINE ARTS IN SAN FRANCISCO, 21 APRIL, 2001.

On this Earth Day as we gather to celebrate our love of our home, let me share with you the celebration of someone I always just thought of as a friend of mine. At this time, in gatherings all over the world, people are coming together to remember Dana Meadows.

Dana died recently, suddenly. Bacterial meningitis. She was 59 years old. To me it was a crushing loss.

I don't know when I first met Dana. Somewhere on the road, some conference, some speaking gig. It just seemed she'd always been there, always been my friend.



Photo: Medora Hebert.

Farewell to My Friend Dana Meadows

By L. Hunter Lovins

Hers was the quiet voice of reason, of impeccably documented science, proving that the time is very short for us to learn of the limits and to put into practice what we already know about how to live within them.

On the first Earth Day I planted a tree. My life was never the same. It began my life-work of solving the sorts of challenges raised on that first Earth Day, challenges that have become ever more pressing. It was two years later that Dana released her earth-nurturing book, *Limits to Growth*, along with Dennis Meadows and Jørgen Randers. And none of our lives have been the same since. Hers was the first definitive word that there are limits, and that the job for us all is to find the fulfillment of our lives within them.

Her critics practiced the big lie: they simply dismissed the book, and continue to today. It must be a frustration to them that the book sold nine million copies worldwide in 28 languages. As Alan AtKisson says, "Unfortunately, Dana has yet to be proven wrong."

Have you read it? Well, don't. Fast forward 20 years and read her sequel, *Beyond the Limits*. Do this as one of the finest ways to honor Dana. And then live your life in a way that shows that you understand what you have read. It's one of those books that is simply a part of being ecologically literate. For those of you who still won't read it, at least read the executive summary that her publisher, Chelsea Green Publishing Company of Vermont, put out. Having just found that the publisher allowed that summary to go out of print, we've scanned it

into our website at (www.rmi.org/sitepages/art1113.asp).

In the book you will read the scientist, Dr. Donnella Meadows, the biophysicist, the MacArthur Scholar, the Pew Scholar, one of the creators of the systems

dynamics computer model that enabled the book to confidently portray its scenarios. In the summary, and in her collected works as a journalist, her column, "The Global Citizen," you'll find my friend, the person that Dana became over 20 years of battling her critics, the passionate, compassionate speaker of the plain truth.

Dana gave constantly in so many little ways to those of us who knew her and loved her. Once at a meeting I was challenging Dana, asking how one can achieve change. Just out of the blue she spoke out a hierarchy of ways to intervene in a system. And after we badgered her enough, she finally wrote it down, and it remains one of the best short guides for an activist. She pointed out that while it is important to argue over such details as numbers and parameters, it is dramatically more important to change

the mindset of the people who make the rules.

Dana's list and a discussion about it between her and various of us at RMI is also available on our website (www.rmi.org/sitepages/art1119.asp).

But she also gave another monumental gift to the world. Dana was one of the founders of the Balaton Network.

Remember the Cold War? Remember then-President Reagan going on a live

of the East. Going there was difficult. Dennis reckoned that every trip took a year off his life, from the pollution and the pesticide-laden food. But it was a yearly pilgrimage that Dana would not have missed. At first it was just systems dynamics experts from the Eastern Bloc and from the United States, who met, supposedly to exchange esoteric computer information. What they actually talked about was fear, and love, and how to create, in the words of Kate Wolf, a "vision that all living things can share."

And the scientists from the East went home and said to their governments that the military paranoia was wrong, that people like Dana would not destroy them. And that war was unnecessary. And it was through such a contact that I made at a Balaton meeting that former RMI staffer Hal Harvey, who now runs the Energy Foundation in San Francisco, was able to deliver to Gorbachev the ideas of unilateral disarmament that contributed to the remarkable winding-down of the Cold War at Reykjavik.

Sometimes we just don't realize on what a fine thread our future hangs, and how the work of just a few people can make an enormous difference. Dana was one of those people.

And today the Balaton network is the finest network of individuals throughout the world working on the issues of sustainability. When that Australian company spilled cyanide into the rivers of Romania, and ultimately into some of Europe's major rivers, those of us on the Balaton network knew of it within a day, and began to mobilize the world wide network of experts in bioremediation. Members of the network are translating Dana's work into a rainbow of languages, a lasting tribute to the vision of one Vermont farmer, and of everyone who realizes, as Wendell Berry says, that "what I stand for is what I stand on." For Dana belonged to the world, but her

heart belonged to the soil of her Vermont/New Hampshire border country. Most times I'd call Dana and ask her to come to some meeting, she would just say, "No, to travel like that would exceed my carbon budget." So she would stay home and write, or help her ewes give birth, or struggle with how to design her new Sustainability Institute.

And how can we possibly go on without her?

When I was struggling to find that courage, my friend and co-author Walter Link observed: "Wouldn't it be an implausible failing of evolution that a species like ours could come to be, that it would evolve to have a consciousness that can grow, that can spend a lifetime learning, as Dana did, how to be effective, and then have the individuals of that species die in such a way that all that is lost to the universe?"

Dana would have liked that comment, while, of course, downplaying her influence. Pavla Polechova, a member of the Balaton network, wrote to Dana, speaking of how much the people in Eastern Europe needed Dana to say all that needed to be said.

Dana wrote back,

Pavla,

You need to pull out of yourselves whatever it is that you admire or rely on in me.

It's in you too! And in every person in your audience! It's all over the universe!

The only trick is to keep ourselves in touch with it!

Love,
Dana

Farewell, my friend. You are now part of that universe that you told us to access. And I'll be in touch. 

" Sometimes we just don't realize on what a fine thread our future hangs, and how the work of just a few people can make an enormous difference. Dana was one of those people."

mike and saying that we launch the bombers at the Soviet Union in five minutes? Those of you too young to remember the cold sweat of fear that a nuclear war could end all life as we know it on this tiny planet are lucky. In those dark days there was no conversation between people in this country and the people, just like us, in the Soviet Union. Perhaps we owe what we have now to Dana and Dennis Meadows, who created the Balaton Network. It met each year in the fall on the shores of Lake Balaton in Hungary, because at that time folk from the East couldn't get out

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