

LONE MOUNTAIN FELLOWS ISSUE

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PERC REPORTS

FOR FREE MARKET ENVIRONMENTALISM



GREEN ENERGY REVOLUTION TO GREEN GRIDLOCK . HOW WILL WE ADAPT TO CLIMATE CHANGE? . DESIGNING RIGHTS-BASED FISHERIES PROGRAMS . ROAD AND TRANSPORTATION POLICY . LITTLE GREEN LIES





PERC

The Property and Environment Research Center is a nonprofit institute dedicated to improving environmental quality through property rights and markets.

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This special issue is dedicated to PERC's Lone Mountain Fellows who are as impressive as Lone Mountain (featured on the cover), which towers over PERC at 11,166 feet. Lone Mountain Fellowships offer a unique opportunity for scholars, policymakers, and environmentalists to advance our understanding of the role of markets and property rights in promoting environmental quality. PERC has hosted 52 Lone Mountain Fellows, representing institutions such as Yale and Columbia University and from countries spanning from Australia to Bolivia. This issue of PERC Reports highlights the work of some of these scholars.

BRIAN STEED arrived at PERC straight from defending his thesis with Noble Laureate Elinor Ostrom. Here Steed explores green against green. Although many environmentalists favor green energy, they loathe its localized impacts. Rather than accept the tradeoffs inherent in green energy production, some have fought the siting of wind and solar farms based on concerns about their impact on the local environment. Green energy is not the problem, they argue—it should just be done elsewhere. But as Steed points out, the “elsewheres” are limited.

Considered one of the top environmental economists in the United States, MATTHEW KAHN recently escaped the southern California summer to enjoy the cooler climate in Montana and to further explore human adaptation to climate change. His recent book Climatology has received critical acclaim.

University of Toronto economist, MATTHEW TURNER, asks a provocative question: Does building more roads to alleviate traffic create more traffic? Turner's research, which he furthered at PERC, suggests a fundamental law of road construction—build it and they will come.

JEFF BENNETT emerged from the land down under to visit the Big Sky State. With more than 30 years of experience researching, consulting, and teaching in the fields of environmental economics, Bennett has turned toward investigating what he calls “little green lies.”

KURT SCHNIER recalls his experience being stuck on an island off Alaska. This circumstance allowed him plenty of time to get to know the local fishermen who encouraged him to think beyond the efficiency gains resulting from rights-based management programs for fisheries.

PERC assembles an assortment of scholars knowing that cross fertilization will advance the frontiers of free market environmentalism. Todd Zywicki, professor of Law at George Mason University summed up the Lone Mountain Fellowship well: “An important element of the program is its interdisciplinary focus—by bringing together law professors, economists, and experts in natural resources, PERC promotes exactly the sort of cross-disciplinary exchange that will be necessary to create innovative public policy proposals in the area of property rights, natural resources, and energy policy.”

Finally, if you are fed up with the presidential campaign, especially when it comes to new ideas for the environment, don't miss PERC's executive director TERRY ANDERSON'S discussion of the need for a Green Tea Party. For more on this campaign visit perc.org/greentea and percolatorblog.org.



Tell me what YOU think
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Laura E. Huggins

Laura E. Huggins | EDITOR

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A SOLUTION IN SEARCH OF A PROBLEM

Thanks to Spencer Banzhaf for his article, “The Case for Cap-and-Trade” as a market application to fossil fuel use. Certainly, once a cap-and-trade system is operating, prices would be set by market trading, responding either to pricing (or taxing) emissions; or setting a quota on allowable emissions. The notion of the government setting the price would be anathema to most free-market folks. However, there is just as much room for mischief if government determines emission quotas, which represent an indirect way of setting prices. Professor Banzhaf presents a distinction without a difference.

The larger problem is that cap-and-trade would impede the production and use of energy. U.S. energy consumption correlates directly with GDP and jobs. If we are to avoid a drop in standard of living, and retain our standing as a world economic power, we must recognize that reliable, affordable energy is essential.

The notion of increasing U.S. energy production—dominated by fossil fuels for the next 30 years—raises the hackles of those who believe in anthropogenic global warming (AGW). But the wheels are coming off the AGW story, based on objective integrated science from many fields other than just research and modeling of Earth’s current and recent climate:

- 1) Historical documentation of the Medieval Warming Period and the Little Ice Age, demonstrating that the recent warming of Earth’s atmosphere is not unusual.
- 2) Geological evidence showing today’s climate as part of cyclical glacial-interglacial fluctuations over the past million years, and demonstrating that rises in temperature precede rises in CO², *not the other way round*. Sea level has been rising for about 14,000 years, and it is not accelerating.
- 3) Recent experiments at CERN, the nuclear particle accelerator in Geneva, directed by Dr. Jasper Kirkby, support Danish cosmologist Henrik Svensmark’s theory that cosmic rays influence the formation of clouds in Earth’s atmosphere, and that periodic solar magnetic flares (sunspots) interfere with cosmic ray flow into Earth’s atmosphere. The correlation of solar irradiation with global temperature has long been recognized, but until Svensmark’s theory and Kirkby’s experimental confirmation, it was thought that such variations were too small to be effective without some powerful feedbacks. Now it looks like solar effects, not CO² concentration, are the dominant cause of variations in global temperature.

Cap-and-trade is becoming a solution in search of a problem.

—Peter R. Rose, Ph. D. (Geology)
Austin, Texas

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WIN A BID ≠ SAVE A WOLF

Thank you for continuing to provide stimulating food for thought. I read Mr. Workman's piece "The Call—or Cull—of the Wild" and found the idea of an open auction interesting. However, Mr. Workman does not seem to fully understand how wildlife management, particularly the hunting and permitting system, works.

My understanding of the hunting license and permit system (in Montana and other states) is that more permits are sold than animals are killed, because there is no guarantee of hunting success. There is not a simple one-to-one ratio of permits to wolves allowed to be killed. So, if the quota of wolves to be killed by hunters is 75, substantially more than 75 licenses will be sold, and the hunting season would close once the reported harvest neared 75 animals.

The number of wolves to be harvested is determined by Montana Fish Wildlife and Parks and other state game management agencies based on biological and environmental criteria related to the sustainability of the wolf population, other species, and habitat considerations. It is not determined by hunters' willingness to pay. Hunting is one means of controlling animal populations. It happens to be a means that has a revenue component.

Thus, a person that wishes to "retire" a wolf permit or purchase a permit with no intent of killing an animal would not be guaranteed that one less wolf would be killed as a result of winning the bid. The number of wolves killed by *hunters* might be reduced, but then the number that would be killed by agency personnel would need to increase to achieve the "peer-reviewed scientific quota." Under this circumstance, it seems unlikely that someone wanting to save a wolf would participate in an auction where winning the bid would not produce the desired effect.

Determining whether or not there is a wolf hunting season based on who is willing to pay more—potential wolf hunters vs. wolf advocates—is the current situation. Only it is lawyers and courts collecting the fees and setting the quotas, rather than state wildlife agencies. If Mr. Workman is advocating that wildlife be managed by markets, then perhaps we should just cut to the chase and put the Endangered Species Act up for sale.

—Todd A. Morgan, Forest Industry Research
University of Montana, Missoula

FLAWED SCIENCE

I strongly disagree with the article by Professor Spencer Banzhaf in the summer issue of *PERC Reports* defending "cap-and-trade" to reduce carbon dioxide emissions to curb global warming.

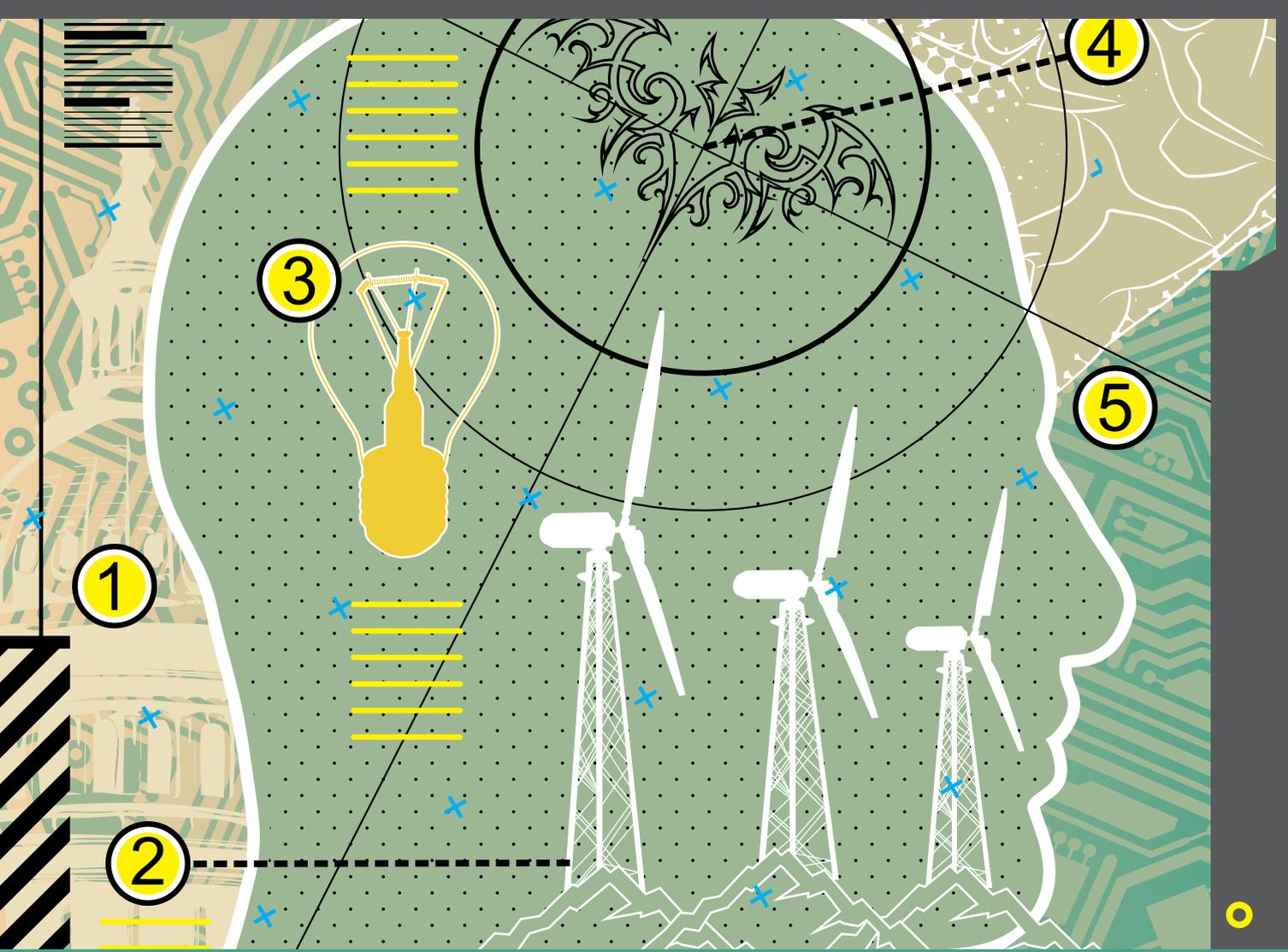
First, the climate is not warming. *Second*, carbon dioxide emissions do not cause the climate to warm. *Third*, cap-and-trade would have disastrous consequences for the U.S. economy. *Fourth*, if China and India do not curb emissions, which they will not, curbing emissions in the United States will be fruitless.

Contrary to assertions by former Vice President Al Gore, the science relating to global warming is not settled. Over 30,000 scientists (9,000 PhDs) in the United States sent a petition to the president protesting the idea that human caused carbon dioxide is causing global warming. There is growing evidence that the "science" supporting global warming is flawed, and heavily influenced by over \$80 billion in government grants.

I do appreciate the professor's support for free market principles.

—Bill Moshofsky
Beaverton, Oregon





From Green Energy Revolution To Green Gridlock

BY BRIAN C. STEED

Judge Roger W. Titus faced a difficult choice in late 2009. The Animal Welfare Institute had petitioned the court to stop the construction of a 186-megawatt energy generation facility in the mountains of West Virginia. The case did not involve fossil fuels or hydroelectric dams, but rather a proposed network of 122 wind turbines located along 23 miles of Appalachian ridgeline.

The institute alleged the proposed building site provided habitat for the endangered Indiana bat. After reviewing the evidence, Judge Titus found that Congress, through the Endangered Species Act (ESA), “unequivocally stated that endangered species must be afforded the highest priority” and “that there is a virtual certainty that

construction and operation of the Beech Ridge Project will take endangered Indiana bats in violation of Section 9 of the ESA.” Accordingly, the court halted construction of additional wind turbines unless an incidental take permit under the ESA could be obtained. For the portions of the project that were already complete, the court mandated that the existing wind turbines could only operate between November and March, when the bats hibernate.

The Beech Ridge case typifies an expanding number of cases where “green energy” generation is curtailed, delayed, or prohibited due to competing environmental goals. There is a growing disconnect between the macro goal of promoting green energy and the micro goal of



Although green energy may provide a cleaner alternative than traditional sources of energy, it has its own set of environmental tradeoffs.

protecting individual species and specific habitats. Using laws and regulations to pursue environmental ends at the micro scale undermines entrepreneurial incentives to create green innovations within the energy sector.

GREEN ENERGY PROSPECTS AND POLICY

Green technologies such as wind, geothermal, tidal, biofuels, and other renewable sources of energy are touted as endless sources of reliable, clean energy. Concerns about the impacts of air pollution and climate change have created a growing market for green energy. Many utility companies, for example, allow consumers the choice of having a portion of their electricity provided by wind or solar technologies. While some of this utility company activity occurs due to state regulations mandating increased reliance on green energy, there is an underlying market for alternative energy.

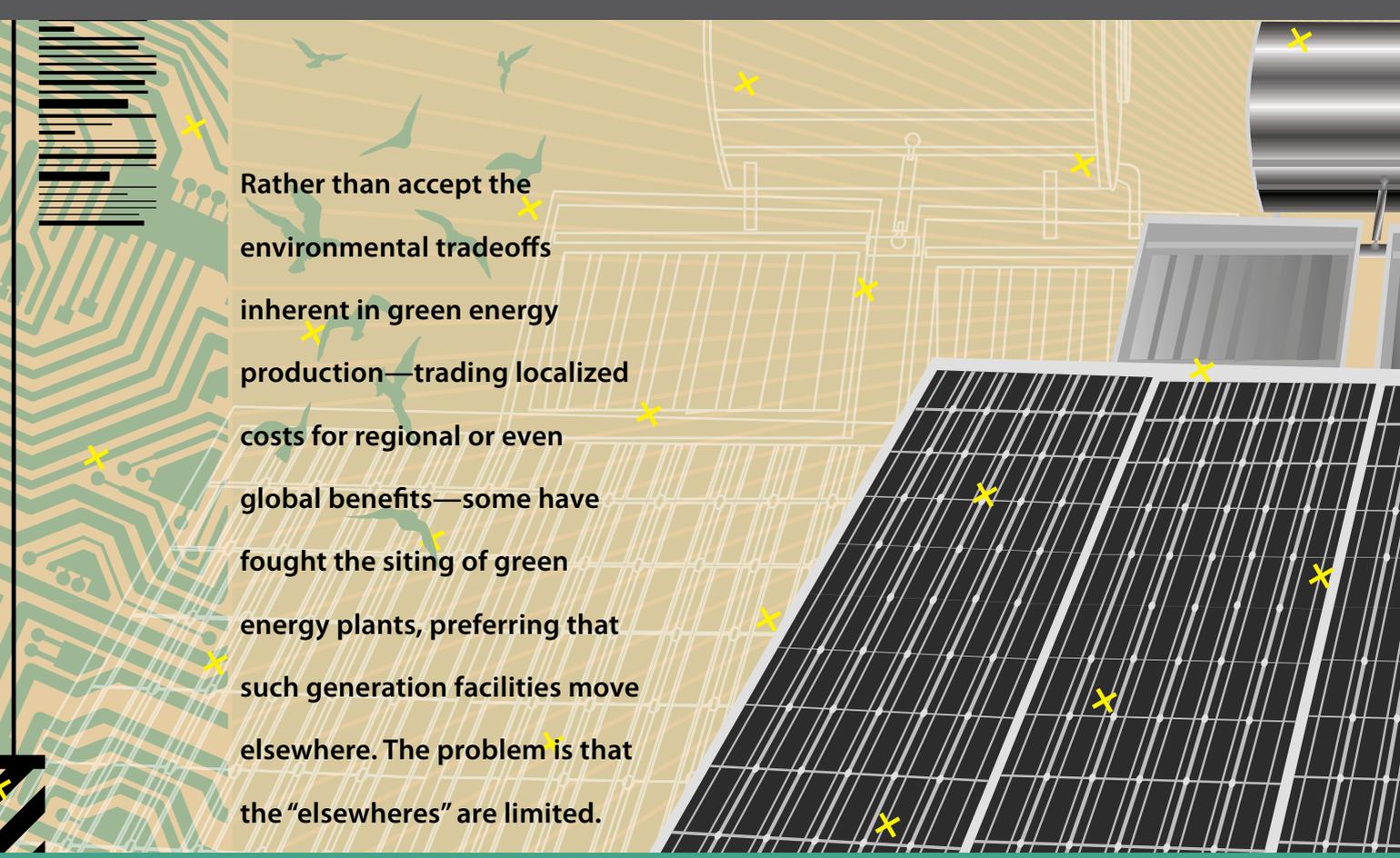
Despite this demand, there has not been widespread development of green sources of energy. In part, green energy generation has been stalled by economic realities—green

technologies are often more expensive and not as efficient as other sources of energy. Yet, even if the economic factors facing green energy were resolved, recent trends point to a somewhat dismal future for green energy. The reason: The existing legal and regulatory structure does not favor any new energy development.

ENVIRONMENTAL IMPACTS

Although green energy may provide a cleaner alternative than traditional sources of energy, it has its own set of environmental tradeoffs. As noted at the outset, wind energy may impact wildlife. Birds collide with wind turbine blades. Bats generally avoid the blades, but are often killed by the air pressure changes caused by the blades' rotation. On the ground, wildlife may be frightened by the movement or the noise of spinning turbines, and the footprint of the windmills can disturb critical habitat.

The footprints of solar, geothermal, and tidal facilities may also impact critical habitats. Biofuel, geothermal, and solar energy generation often require large volumes of



Rather than accept the environmental tradeoffs inherent in green energy production—trading localized costs for regional or even global benefits—some have fought the siting of green energy plants, preferring that such generation facilities move elsewhere. The problem is that the “elsewheres” are limited.

water. All large-scale land-based green energy generation facilities are land intensive, and large tidal energy facilities require substantial offshore areas, which can impact the aesthetic qualities of undeveloped areas. Biofuel refineries have the additional complication of potentially polluting local air and watersheds. And all sources of green energy face transmission issues. Green energy is often generated in remote areas and must be transmitted from those areas to areas of high demand. Moving electricity often involves building transmission facilities that cross sensitive landscapes.

These facts have created dissonance among environmentalists. Many favor green energy but find its localized impacts repugnant. Rather than accept the environmental tradeoffs inherent in green energy production—trading localized costs for regional or even global benefits—some have fought the siting of green energy plants, preferring that such generation facilities move elsewhere. The problem is that the “elsewheres” are limited.

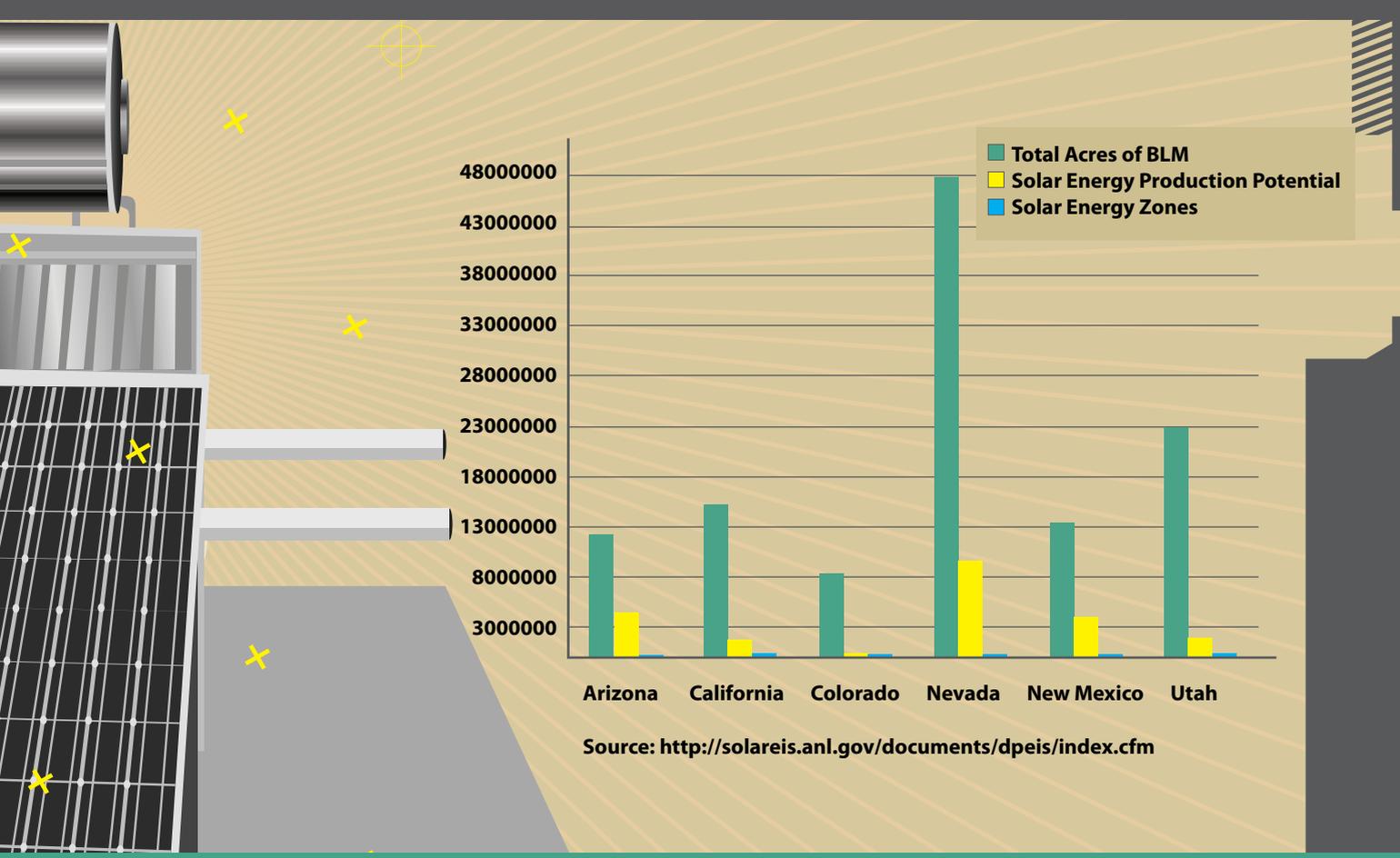
THE REGULATORY SETTING

Green energy generation often requires specific physical conditions. Wind energy facilities require predictable wind conditions, geothermal facilities require appropriate aquifers of hot water, and solar requires a combination of sufficient sunlight and a slope of about 3 percent. Finding

areas that both meet these conditions and are not controversial is difficult. In addition to the challenging geophysical requirements, existing federal and state environmental laws and regulations provide a strong arsenal of weapons to use against siting green energy generation facilities and proposed transmission lines.

Consider the Cape Winds project off the coast of Massachusetts in Nantucket Sound. The Cape Winds project has faced intensive regulatory reviews pursuant to the National Environmental Policy Act. The review of this project began in 2001 and did not end until 2009. This process included the preparation of two Environmental Impact Statements by two separate federal agencies. The actual permitting for the project did not occur until the spring of 2010 when 17 federal and state agencies finally signed off on the proposal. Then, the litigation began. Various environmental groups have alleged the project will negatively impact migratory birds and whales, including some endangered species. Local fishermen’s associations have also sued, alleging harm to fish stocks. Now, the project faces a claim by the Wampanoag tribes that the project will take away their cultural and religious heritage by impeding an unobstructed view of the sunrise over Nantucket Sound.

On the other side of the country, the deserts of the southwest provide ideal conditions for large-scale solar generation. Yet groups are already preparing to fight



against building such facilities. The Bureau of Land Management (BLM) recently prepared a draft Environmental Impact Statement for solar energy sitings on BLM lands in Arizona, California, Colorado, Nevada, New Mexico, and Utah. The agency first identified areas with physical conditions appropriate for solar energy production that have not already been set aside as Wilderness, Wilderness Study Areas, Areas of Critical Environmental Concern, National Monuments, or parks. Next, the BLM worked with the states to identify lands that could be readily developed without substantial environmental controversy.

This process resulted in the BLM identifying Solar Energy Zones (SEZs), which are a mere sliver—less than .01 percent—of BLM lands in the five states. Even the SEZs, however, have proven to be controversial. A variety of groups presented negative comments during the public comment period on the SEZs. The Southern Utah Wilderness Alliance, for instance, noted that the Wah Wah Valley—one of three proposed SEZs in Utah—is too close to lands with wilderness characteristics. Other groups complained about insufficient water in the Wah Wah to keep the solar panels clean, which is crucial for efficient production. All told, the amount of non-controversial land available for solar energy production on public lands in the five states presents a dim outlook for widespread solar production in the near future. See the figure above.

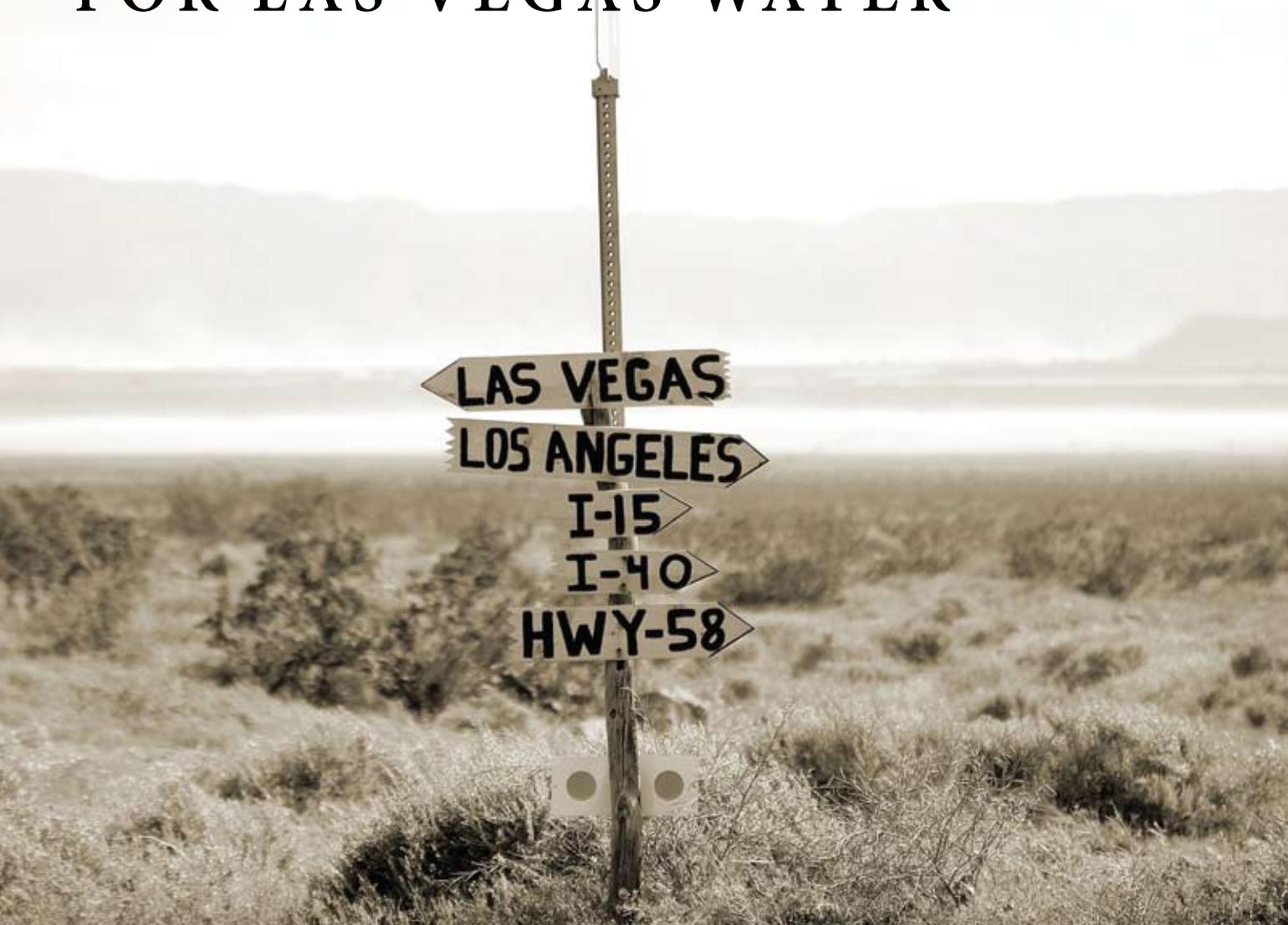
Federal and state regulations reach sufficiently far to impact energy proposals on private lands. The U.S. Chamber of Commerce recently concluded a study examining regulatory roadblocks to energy development and identified more than 300 energy projects currently on hold across the United States. About half of these were green energy projects, the majority of which are on private lands in the eastern United States.

The transition to green energy faces a rocky road ahead. Despite politicians' willingness to dump large subsidies into green energy generation, there has been less willingness to enact the regulatory reforms necessary to allow large-scale green energy production. Even if and when green energy technologies become economically viable, they will be constrained by regulation. This fact dampens the likelihood that green energy will prosper.



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A MARKET-READY SOLUTION FOR LAS VEGAS WATER



With the famous slogan (*What happens in Vegas, stays in Vegas*), the convention and tourism bureau in this city of lights—the brightest place on the planet, seen from outer space—tells visitors they are exempt from the wages of sin.

Not to be outdone, the local water authority promises cheap water in the middle of a scorching desert. Try to figure this out: A family of four in Las Vegas pays \$1 a day for 400 gallons of water; a family of four in Atlanta—with 13 times the precipitation—pays \$2 for the same amount of water.

While most big cities sit on the banks of a river, lake, or ocean, bone-dry Las Vegas owes its existence to the Hoover

Dam, 34 miles away. The dam is the source of cheap water and power. Without the one, the myriad of fountains along the Strip would cease to dance, the 60 golf courses would wither, and thousands of pools would no longer fill. Without the other, the lights would dim, and the air conditioners would stop humming. In the words of one official, the sprawling metro area of 2 million people would revert to “a place of sand dunes, mosquitoes and rattlesnakes.”

Originally, it was thought that Mormon farmers would use the Colorado River water captured by the dam to create a smaller version of California’s Imperial Valley. That is

not what happened. Instead, when work on the dam began in 1931, the city filled with a rowdy army of construction workers. Their employer, the U.S. Bureau of Reclamation, “invented modern Las Vegas.” As Emily Green of the *Las Vegas Sun* tells the story: “[The workers’] needs could be largely summed up in a telephone book under B: boarding houses, brothels and bars. Moreover, that same year, Nevada legalized gambling. Las Vegas added a C to its key services: casinos.”

No one expected the small number of people in and around Las Vegas at the time to pick up any portion of the capital cost of building the dam. Like other big Depression-era projects, it was both launched and paid for by the federal government.

Three-quarters of a century later, a super-sized Las Vegas continues to rely on Lake Mead, behind the dam, for nearly 90 percent of its water. The water still costs very little. And the federal government continues to supply cut-rate electricity—giving the city power at less than half the wholesale price.

Will Las Vegas ever outgrow the great store of water that makes the desert bloom and allows the lights to burn so brightly? The city’s water czars live in fear of that possibility.

The Southern Nevada Water Authority (SNWA) and its smaller sister organization, the Las Vegas Valley Water District (LVVWD), have adopted a wide range of restrictions to limit water usage, including one that bans restaurants from serving unsolicited tap water. Upon visiting the water authority’s web site, one finds a list of restrictions:

- › Sprinkler watering is prohibited from 11 a.m. to 7 p.m. (May through October).
- › Mist systems at commercial businesses may not be used (September through May).
- › Fountains are restricted at commercial and multi-family properties.
- › New grass is prohibited at commercial properties and new residential front yards.
- › Car washing requires the use of a positive shutoff nozzle to reduce water flow.

To enforce such regulations, LVVWD employs its own “water police” who go around town looking for violations. In 2009, the water police investigated more than 6,000 cases of wasteful water uses and issued nearly \$100,000 in fines. Employing the carrot as well as the stick, the water authority pays homeowners up to \$7,500 to rip out green lawns.

But it is the supply side rather than the demand side where the water authority hopes to hit it big. In October 1989, LVVWD applied for unclaimed groundwater in

northeastern Nevada, with an estimated pull of as much as 800,000 acre-feet of water, or just about double the allocation from Lake Mead. To bring that water to Las Vegas would require a 300-mile pipeline.

There was fierce opposition from ranchers, farmers, environmental groups, and others in Nevada and Utah. The controversy continues today. Opponents say that pumping the aquifer beneath the Great Basin would turn a sparse but beautiful desert landscape into a giant dust bowl. They say it would kill plants and wildlife and recreate the disaster of California’s Owens Valley.

The controversy died down for a while as the water level at Lake Mead was rising—calming fears of water shortages and causing SNWA to table its plan. The lake reached an all-time high in 1998. But that was also the beginning of a 12-year drought, which caused the lake to fall below 50 percent of capacity. Suddenly, alarm bells were ringing inside the water authority. In 2008, it began to build a massive underground tunnel to assure its continued ability to suck water from the lake.

Now, SNWA and its supporters are demanding immediate action on the proposed pipeline, while opposition groups have become increasingly energized as well. SNWA admits that a near-doubling in water rates may be needed to finance the \$7.2 billion project.

Here’s a proposal that the water authority seems not to have considered: Since water rates appear to be going up anyway, discard the historic cost-based pricing model and move instead to a pricing system that recognizes the scarcity value of water. Allow water rates to double or triple. Encourage free trading in water rights by homeowners and others. See if that doesn’t avert the need for any construction. Call this a *market-ready*—as opposed to a *shovel-ready*—solution.



ANDREW B. WILSON, 2011 PERC media fellow, is a fellow at the Show-Me Institute, a free-market think tank in St. Louis. Wilson is a regular contributor to leading national publications, including *The American Spectator*, *The Weekly Standard* and the *Wall Street Journal*. He can be reached at abwilson@swbell.net.

How Will We Adapt to Climate Change?

A Free Market Economist's Perspective

BY MATTHEW E. KAHN



2011 has been an exciting year for meteorologists. The United States has experienced a wide range of strange weather including dust storms in Denver, Colorado, deadly tornadoes in Joplin, Missouri, and severe drought across Texas. Many climatologists believe that extreme weather events are the result of climate change and use such events to buttress arguments for policies to curb greenhouse gas emissions.

These events and predictions, however, have not induced policymakers to take action. As an economist, a home owner in West Los Angeles, and the father of a ten-year old son, I find myself asking how our quality of life will evolve as we face the challenge of climate change. How will Los Angeles be affected by climate change? Will my son's standard of living be higher than mine, or would he be willing to pay to get onto a time machine to live his life back when his grandfather lived?

THRIVING IN A HOT FUTURE

My book, *Climatopolis: How Our Cities Will Thrive in the Hotter Future*, provides some answers. It presents an optimistic vision of our urban future. All over the world, people are moving to cities. Some cities are large (think of Los Angeles) while others are small (think of Bozeman). Cities offer us the opportunity to specialize, trade, and learn. In this sense, cities are a key part of free market capitalism.

Of course, urbanites import food from rural farms. A whole field of scholars is exploring how climate change will affect agriculture. If urbanites have access to unfettered free international trade in agriculture, for example, then they will be protected from location-specific shocks to agriculture. After all, if Siberia has a bad wheat harvest, then another area of the world will be able to sell its crop for a price premium. International trade breaks the link between consumption and production and offers a



Q&A with Randal Rucker, PERC Lone Mountain Fellow, on Bees, Colony Collapse Disorder, and Adaptation

For more of PERC's ongoing Q&A series visit percolatorblog.org

Q: How is colony collapse disorder (CCD) affecting bees and beekeepers?

A: With CCD, a beekeeper will check his hive one day and find it to be healthy. When he comes back to check it again, those hives that have been hit by CCD will have few or no adult bees present. The queen often remains, the colony contains food, and there is brood remaining. The adult bees are nowhere to be found.

CCD has increased the costs of beekeeping. Commercial beekeepers now make more splits (see below) going into the winter. If a beekeeper does not get hit by CCD, then he probably has more hives in the spring than he had going into the winter. If he gets hit by CCD then he may lose half or more of his colonies. In this case, if he has contracts to pollinate almonds in the spring, he will have difficulty fulfilling those contracts.

Q: Why has the media portrayed CCD as a crisis?

A: CCD is a crisis for those beekeepers that get hit hard by CCD. In aggregate, however, our research suggests that most market indicators have not changed noticeably since the onset of CCD. Colony numbers have not fallen, honey prices have not risen, package and queen prices have not shown dramatic increases, and honey production and yields have not been affected. With the exception of almond fees, pollination fees have not changed much since the fall of 2006 when CCD first appeared. Our analysis suggests that almond pollination fees have risen (by roughly 10 to 15 percent) since the appearance of CCD.

Why has the media portrayed CCD as a crisis? Possibly because most people do not understand how beekeeping and pollination markets work. There has been limited acknowledgement in the press that

Individuals, not government, will make the best choices for themselves, recognizing the constraints and challenges that climate variability is posing.

type of insurance against local agricultural weather shocks. Trade allows us not to “put all of our eggs in one basket.”

By the definition of living and working in a city, urbanites are less exposed to climate change’s impacts than rural people. Think of one’s day-to-day life in a typical city. A person wakes up and commutes to work. This person works inside of a climate-regulated building. Such individuals do not spend much time outside. Where you live and work will determine the risks you face from heat waves, flood, and disease posed by climate change. Climate scientists will likely make progress in predicting which geographical areas face which risks posed by climate change. Armed with this information, households and firms will make new choices concerning where to locate and what types of structures to build.

Anticipating suffering caused by climate change actually creates new solutions.



It is important to note the emphasis on individual liberty and individual choice here. Individuals, not government, will make the best choices for themselves, recognizing the constraints and challenges that climate variability is posing. If a person has more resources and money, then he or she will have more strategies to cope with climate change. Free market growth is a major adaptation strategy. Richer people can migrate to safer areas, live in better quality housing, and afford more self-protection investments such as air conditioning, better foods, and better medical care.

ENTREPRENEURS AT WORK

Anticipating suffering caused by climate change actually creates new solutions. While many people may be like Homer Simpson and never think beyond today, there are always a few entrepreneurs—picture the late Steve Jobs or Mark Zuckerberg—thinking about what will be the next “big thing.” If only 3 out of a 1,000 people anticipate that we will need more energy efficient appliances, renewable power, floatable homes, or foods that can withstand heat

extremes, this means that in a world of 7 billion people there are 21 million entrepreneurs at work. With this many “lottery tickets,” could they all fail? Those entrepreneurs who succeed at designing adaptation-friendly products will grow rich selling to people in our hotter future. Today, we take our Smartphones and ATM machines for granted. I foresee a future where entrepreneurs devote their efforts to protecting us. In this sense, capitalism will evolve to help us cope with the coming challenges we are likely to face.

The emphasis on the choices of self-interested individuals and firms as playing a key role in protecting people from climate change has angered critics of *Climatopolis*. They claim that I oppose government and do not believe in collective action. This blanket statement is false. I do not believe that government is Santa Claus. I view politicians as self-interested. A politician will address climate change if his or her own interests are threatened by ignoring the issue. Consider the incentives of center city mayors. In a nation that has many cities to choose from, if a city’s quality of life is sharply degraded by climate change, due to flooding and heat waves, the mobile and young skilled workers will move away and such skilled people will not move to that

city. Today, Detroit is poor because it cannot attract and retain skilled workers. Highly educated people are the modern “golden goose” for cities. Anticipating this will give local politicians incentives to adapt to climate change. If they do not, then local land prices might fall and homeowners in such cities will suffer.

In *Climatopolis*, I anticipate that government will play a constructive role in generating real-time information about the evolving challenges cities face. Information is a public good and trusted cities will produce new flood maps and provide real-time information announcing smog alerts (i.e. warnings that the next day will be highly smoggy). Such information will allow people to make better choices and adapt at a higher frequency. Other government actions may backfire and slow down adaptation. In Texas today, there is a drought but water prices are still low. A free market economist would advocate allowing prices to signal true scarcity. Rising water prices would provide strong incentives to con sitings serve water and seek out new products that help with this process.

CREATIVE ADAPTATION

Free market capitalist growth has contributed to climate change. As billions achieve the American Dream in a world without an explicit carbon price, greenhouse gas emissions will likely continue to rise. But, I maintain that capitalism will help us solve many of the adaptation challenges we will face.

A major theme of *Climatopolis* is that as climate scientists continue to make progress with modeling climate change and as individuals learn about the day-to-day challenges climate change poses for different cities, residents will take proactive steps to adapt to changing circumstances. No doubt “new news” will continue to arrive. The Moscow heat wave in the summer of 2010, for example, was horrible and surprising, but the “silver lining” of such a shock is that the city learned that it is at risk. I predict that the city will make costly investments now to lower the impact of the next heat wave. This basic logic is why I am optimistic about our urban future. We have the right incentives to learn and to adapt to our changing environmental conditions.



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beekeepers lose bees every winter and that they know how to deal with those losses.

Q: How is CCD affecting pollination markets?

A: Most of the market measures you can think of that might indicate a crisis have not changed much. The back-of-the-envelope calculations we have done to date suggest that the increase in almond pollination fees we have found probably causes the retail price of a \$7 one pound can of Blue Diamond almonds to increase by about three cents.

Q: How do beekeepers adapt to increased mortality in their bee colonies?

A: There are several methods by which commercial beekeepers can increase their colony numbers to offset the potential increase in winter mortality since the onset of CCD. Our surveys of Washington and Oregon beekeepers suggest that the most frequently used method has been splitting and re-queening. Beekeepers can split a healthy hive by taking up to half the colony’s population, and placing those bees in an empty colony. They purchase a queen for the new colony and have it delivered through the mail. The process of transferring the bees to a new colony takes a good commercial beekeeper about twenty minutes. Today, the queen might cost them \$15–\$20. Depending on how many bees were extracted from the original colony, it can be at sufficient strength to provide pollination services within a relatively short time period. Within about six weeks, the new colony will be at full strength.

Q: What lessons can we draw from the adaptation of beekeepers?

A: Markets work. Honey bees are resilient, and commercial beekeepers are savvy businessmen who have figured out how to respond to the problems caused by CCD. The data on the market indicators mentioned above suggest that beekeepers have adapted to this new disease quickly.



Designing Rights-Based Fisheries Programs

BY KURT ERIK SCHNIER



The evidence is in: Catch shares and other rights-based fisheries management programs work. They work on a number of dimensions—longer seasons, fresher product, more efficient use of fishing capital and labor, increased safety, and perhaps most importantly, the potential to halt or reverse worldwide trends in overfishing.

The benefits of a rights-based management (RBM) regime can be observed in the Bering Sea/Aleutian Island federal crab fisheries. In 2005, these fisheries converted to a RBM program. The two largest fisheries impacted by this regulation were the red king and snow crab fisheries. Participation in these fisheries peaked in 2004 with 229 boats fishing for red king and 173 boats fishing for snow crab. The number of active vessels today has fallen to approximately 31 percent and 36 percent of their peak pre-RBM levels. Furthermore, the length of the season has increased considerably, relative to what it was during the pre-RBM period.

The contraction in the fishing fleet and extension of the season is a direct response to the altered incentive structure resulting from the transition to a RBM program. Those fishers who were more efficient at harvesting the resource remained in the fishery and purchased rights from the less efficient fishers.

My first experience with these fisheries came during a trip to Dutch Harbor, Alaska. The trip began by flying in the middle of blizzard to arrive at Unalaska Island. The captain landed twice along the way to refuel due to the excessive head winds, and the passengers were told that no more planes were going to be coming and going for some time. Although I spent much of the time vexing over the question of whether I would ever get home, the experience allowed me to spend plenty of time talking with boat captains and crew members.

Initially, I was solely focused on the efficiency gains that resulted from the transition of these fisheries to RBM



Q&A with Claire Priest, PERC Lone Mountain Fellow, on the Origins of American Property Law

For more of PERC's ongoing Q&A series visit percolatorblog.org

Q: How do the laws and institutions in early America affect modern property rights and law?

A: We take it for granted in America that credit is easy to come by and that we will receive financing for purchase of assets from cars to homes. In many countries, however, the institutions and courts are costly and time-consuming to navigate. I have been interested in how history might explain the vastly different legal environments around the world today.

I also think the history is closely related to the insights of PERC: being able to use property rights to achieve conservation outcomes requires a system that is flexible. To give a prominent example, markets in carbon credits are now well-established in our country. Where did the flexibility in the system come from that allows trading in a good like carbon emissions?

Q: What does your forthcoming book, concerning the evolution of property law in early America, emphasize?

A: In my view, the central force shaping property law in early America from the earliest years of colonization was the desire to use land and other assets, such as slaves, as collateral for the purpose of obtaining credit. The colonists brought English law and legal traditions with them but reformed those laws to adapt to the new conditions present in the colonies. In the American colonies, creditors were given legal priority to land over the landowner's heirs during inheritance proceedings. Colonial courts and land recording offices also innovated by making title interests and the claims against those interests publicly accessible.

Unfortunately, strong credit markets encouraged the expansion of slavery, a form of labor that depended on upfront payments of money. Slaves were often purchased

Chatting with the local fishers I became more aware of the issues they faced; they spoke of the extra time they spent delivering crab to processors, the restrictions placed on the transferability of their quota, and concerns of quota consolidation.



programs. But after chatting with the local fishers I became more aware of the issues they faced; they spoke of the extra time they spent delivering crab to processors, the restrictions placed on the transferability of their quota, and concerns of quota consolidation. These discussions provided a firsthand account of the efficiency-versus-equity battle that often ensues in these environments and has prompted me to think more about the economic tradeoffs.

EFFICIENCY VERSUS EQUITY

Many economists have long been advocates of RBM programs for marine fisheries—especially if the rights are transferable and can flow to those individuals who value the resource the most. This system minimizes the costs of harvesting and fosters environmental stewardship—all while using market forces.



Rights-based management programs are now being used across the globe—approximately 25 percent of the total global fishery volume is executed under a RBM regime. But many of these programs do not act as precisely as economists—forever obsessed with efficiency—might wish. The rules and restrictions of each system vary widely and they are not based on the same economic principles (development of property rights to eliminate the race-for-fish) that motivated the need for RBM regimes. Other concerns, primarily about equity, are central to their design, and often manifest themselves in ways that may jeopardize the efficiency and appeal of rights-based fishery management.

The evolution of a RBM program can be best illustrated by analogy. Think of a fishery as a giant pie. Under the race-for-fish regime, the pie begins to shrink in size as more and more fishers adversely affect the long-term health of the resource. This competition is in and of itself an economically rational behavior, but it is not sustainable. The shrinking of the pie often motivates the creation of a RBM program. Once the program is created, the race to extract value from the fishery changes from one generated by a race-for-fish to a race-for-representation situation. This race-for-representation reflects the interest of the different constituents in mobilizing to increase their slice of the pie; a pie that will likely increase in size over time as the resource rebuilds.

RACE FOR REPRESENTATION

The race-for-representation process is motivated by equity concerns among the different interest groups, but we often fail to acknowledge that catering to these interests comes at a cost to economic efficiency. Two common results from the race-for-representation are restrictions on the allocation and transferability of fishing rights, which often interact and compound to further restrict the

rights. Allocation restrictions dictate to whom the rights of the resource are conveyed. The allocation of rights at the inception of a RBM program are predominately awarded to those individuals who have historically participated in the fishery, but the precise definition of “who” is not always transparent. The allocation of quota tends to come in accordance with where people fall on the continuum of organized interest groups. The best-represented individuals are those who can cost effectively organize to influence the creation of the RBM program.

The allocation rules following the implementation of a RBM program do not generate a direct loss in economic efficiency by themselves. If the rights are freely transferable and transaction costs are low, then the economic theory of Nobel laureate Ronald Coase predicts that an efficient allocation will still result. Therefore, from an efficiency standpoint, allocation restrictions are secondary to the transferability restrictions often contained in the implementation of a RBM program. When the transfer of rights is restricted, however, losses in economic efficiency may arise.

A well-structured property right must be enforceable, exclusive, and transferable. Generally RBM programs satisfy the enforceability and exclusivity requirement as they are backed by the issuing government and the returns from the right flow to the owner. But the transferability requirement is often violated following the initial allocation of the rights. These transfer restrictions are implemented to restrict the flow of resource value to specific groups within the fishery.

A large portion of the economic efficiency gains that are achievable following the transition to a RBM program, result from the consolidation of rights and the elimination of excess capacity, as has been observed in the Alaskan crab fisheries. It is possible, however, for a few firms to remain following this process. Often times this is thought of as inequitable and restrictions are put in place to prevent

“over consolidation.” In the red king and snow crab fisheries there is a 1 percent consolidation rule that prevents any quota owner from possessing more than 1 percent of the total owner quota pool precisely for this reason—grandfathering exceptions aside.

THE TRADEOFF

Perhaps the most troubling efficiency-equity tradeoffs result when allocation and transferability restrictions interact. When the Alaskan crab fisheries transitioned to a RBM program, for example, rights were awarded to both the fishers and the processors participating within these fisheries. The processor rights dictate to whom, conventionally thought of as northern or southern processors, a fishers’ quota must be delivered. The pairing of these two rights restricts the transferability of shares because a northern share cannot be traded for a southern share. This restriction assures that the value of the fisheries will flow to the same regional communities and processors that have historically been impacted by these fisheries versus allowing a free market to establish the most efficient flow of resources. This approach further reduces the potential efficiency gains from a well-structured market.

Although it is easy for an economist to say that these restrictions compromise the efficiency gains achievable in a well functioning market, quantifying them is a less tractable problem. This is because we must be able to calculate what the “perfectly efficient” outcome would be in absence of the restrictions. As more research is conducted in this area we will be able to more definitively calculate these efficiency losses and determine when they do and do not compromise the objectives of the RBM program.

When policymakers decide to allocate rights under an RBM program, the allocation rules and subsequent transferability restrictions generate a restricted market. Currently, there is no RBM program that perfectly aligns with the economic theories used to rationalize their creation. This disjoint warrants further consideration.

An important question for fishery economists to answer is what is the magnitude of these different efficiency-equity tradeoffs and the resulting increased economic costs? If these tradeoffs are substantial, then efforts should be focused on ensuring that policymakers address them. If the tradeoffs are small, then perhaps the end justifies the means.



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on credit and themselves became a primary form of collateral in credit agreements. I believe this story is very important to our history.

Q: You claim Hernando de Soto has glossed over some important details when it comes to the history of capital formation? Can you offer a few examples?

A: I admire that de Soto has drawn attention to how property laws and institutions affect the economy and capital formation. In the current draft I use de Soto’s work to illustrate a different issue, which is the gap in the scholarship on the history of property laws and institutions of the American colonial period. De Soto’s *The Mystery of Capital* includes a chapter called “The Missing Lessons of U. S. History” which focuses on preemption rights for squatters in the nineteenth century American West. I ask the question: what were the origins of the property system that was able to give rights to western squatters? What happened in the earliest years of colonization as these laws and institutions were initially put into place?

Q: Would it be possible to replicate America’s evolutionary experience with property law in a globalized context today?

A: That is a very difficult question. What I have been struck by in my close reading of colonial documents is that early America presented an opportunity for colonial legislatures to establish and reshape institutions in ways that conformed to the needs and preferences of the population. When an institution was not working right, the state legislature would pass an act to fix the perceived problem. The legislatures were sorting out the kinks in the system for over a hundred years. I think that property law reforms can be helpful but there needs to be a mechanism for local people to have input into how the institutions can best serve their needs. Courts and land title registries only work well as underpinnings of a property system when they have legitimacy and authority within the community.





KERMIT FOR PRESIDENT AND PERCIES FOR HIS CABINET

For too long, conservatives have considered the environment to be their Achilles heel. If you are conservative you are in favor of economic growth, free markets, and less government, all of which are seen as the antithesis of environmentalism. In short, as Kermit the Frog understands, “It’s not easy being green.” But thanks to PERC, you and Kermit can be conservative and green.

That is why PERC is supporting “Kermit for President” under the banner of the Green Tea Party (GTP). While Democrats continue to throw money and regulations at environmental problems, and Republicans continue arguing that jobs and the economy must trump environmental protection, the GTP would build its platform on free market environmentalism. The GTP’s platform would have only two planks, both of which focus on prosperity and incentives to drive environmental improvements, not bureaucracies.

The first plank is *wealthier is healthier*. This plank is built on evidence that environmental quality improves as people get richer and demand cleaner water and air, more wildlife habitat, and so on. Hence, Kermit would appoint PERC senior fellow Bruce Yandle, who helped pioneer this research, to chair his Council of Economic Advisors. Yandle would promote economic growth, not as an alternative to environmental quality but as a necessary prerequisite for it. When coupled with overwhelming evidence from PERC research that economic growth results from secure property rights and a strong rule of law, the GTP has a recipe for improving the environment that starts with economic progress and a strong private sector, not with more federal spending and regulations.

The second plank is *incentives matter*. Free market environmentalism emphasizes that all environmental problems are property rights problems, which, in turn, implies that all solutions to environmental problems must start with better definition and enforcement of property rights.

The list of qualified “PERCies” to join Kermit’s administration in support of property rights and markets is long. Kermit, for example, would tap PERC senior fellow Donald Leal to head the National Marine Fisheries Service. Leal has documented that declining fisheries around the world have not improved with regulations, which limit seasons, boats, and gear. He would implement individual transferable fishing quotas—property rights to fisheries—as a way of lengthening seasons, reducing costs, improving fish quality, and increasing profits for fishers.

As co-authors of a forthcoming book, *Tapping Water Markets*, PERC research fellows Brandon Scarborough and Reed Watson would be Kermit’s choices to head the Bureau of Reclamation and the Corps of Engineers. They understand that these agencies have continually subsidized flood protection, water treatment plants, irrigation, and hydropower. By making water cheaper than dirt, federal policies have encouraged inefficient uses of “blue gold.” Scarborough and Watson would tap water markets instead of tapping the U.S. treasury.

Kermit would appoint PERC research fellow Holly Fretwell to head one of the land management agencies such as the Forest Service, Park Service, or Bureau of Land Management. In her book, *Who’s Minding the Federal Estate*, Fretwell shows that the Forest Service lost an average of \$3.58 billion per year between 2006 and 2008 while managing lands worth trillions. Moreover, she documents that an estimated 39 million acres are at risk to catastrophic wildfire and another six million are dying from insect infestation. Alison Berry might

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assist Fretwell. Berry's *PERC Policy Series*, "Two Forests under the Big Sky," demonstrates that between 1998 and 2005 the Salish-Kootenai Confederated Tribes in Montana earned \$2.04 for every dollar they spent on tribal forests, while maintaining endangered species habitat and improving water quality, while the adjacent Lolo National Forest earned only \$1.11. Berry and Fretwell would require their agencies to earn a profit or turn the land over to state agencies, tribes, companies, or environmental groups with a record of fiscal and environmental stewardship.

Other PERCies for policy positions: Dan Benjamin, author of "Recycling Myths Revisited," as Director of EPA, Roger Meiners or Andy Morriss, authors of *The False Promise of Green Energy*, as secretary of the Department of Energy; and Laura Huggins, editor of *PERC Reports*, for Press Secretary.

Kermit and his PERC-filled administration would be environmentalists who care about results instead of rhetoric. They wouldn't strut their stuff in clothing made from recycled materials while driving their hybrids to an environmental protest. Kermit knows that environmental quality cannot be bought simply by throwing more taxpayer dollars and more

regulations at environmental problems. That is why the GTP can promise to deliver budget cuts and environmental quality.

Kermit and the GTP have confidence in a growing number of environmental entrepreneurs who are working to do good for the environment while doing well for themselves. Such enviropreneurs, as they are called at PERC, do not need more regulations and bigger government deficits; they need secure property rights. Property rights lead to entrepreneurship, entrepreneurship leads to prosperity, and prosperity leads to environmental quality.

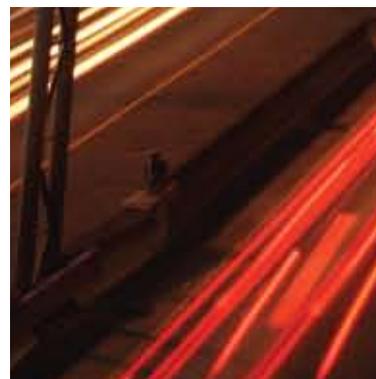
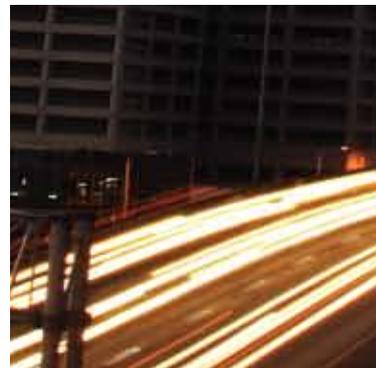
If you think it is time for environmental policy change, then it is also time to step up your support for PERC. As the world's oldest and largest institute promoting free market environmentalism, PERC's research, outreach, and applied programs show that a sea of red ink is not the pathway to a green planet. If you are really an environmentalist, invest in real environmental policy change by making a contribution to PERC today!

In "On Target," PERC's executive director Terry L. Anderson confronts issues surrounding free market environmentalism. He can be reached at perc@perc.org.

Road Congestion & Its Implications for Transportation Policy

BY MATTHEW A. TURNER

A fundamental law of road congestion: Adding 10 percent more lane miles to a city increases vehicle miles traveled by 10 percent.



Previous attempts to build our way out of urban traffic congestion have been largely self-defeating in the sense that, sooner or later, new roads tend to create more demand for driving. Capacity additions can still be worthwhile, however, particularly if new roads are priced to encourage their most efficient use. Cross-the-board improvements in bus service may also produce economic benefits sufficient to justify their costs.

In 2001, the average American household spent more than two and a half hours (or 161 person-minutes) per day in a car to accomplish travel that required only 147 minutes in 1995. Multiplying by households and working days, we find that U.S. households used about 5 billion more hours in 2001 than in 1995 to accomplish the same amount of routine daily travel.



Q&A with Michael 't Sas-Rolfes, PERC Lone Mountain Fellow, on Markets for Endangered Species

For more of PERC's ongoing Q&A series visit percolatorblog.org

Q: In 1998, you authored a PERC Policy Series called "Who Will Save the Wild Tiger?" What has changed in the world of tigers?

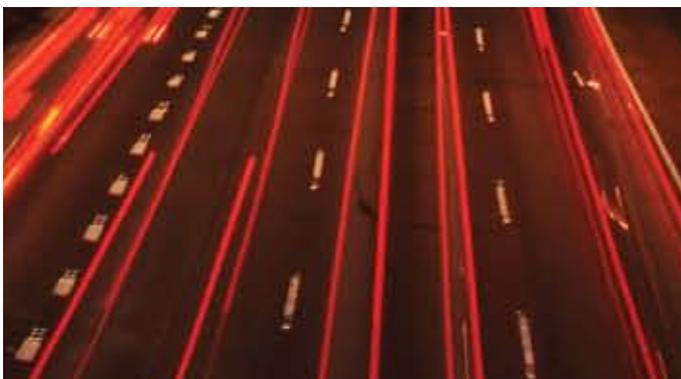
A: A lot has been done. There have been many conservation initiatives, much money spent, and many, many meetings. A wide range of conservation NGOs and even the World Bank established initiatives, culminating in last year's grand "Tiger Summit" in St. Petersburg, Russia. Wild tiger numbers, however, have continued to decline. In 1998 the estimate of wild tiger numbers was between 4,800 and 7,300. Last year the official World Wildlife Fund estimate was 3,200. So in another sense, not much has changed at all—the wild tiger remains in trouble.

Q: What are the incentives for tiger conservation?

A: Conservation NGOs benefit from the tiger's charismatic high profile as a means to raise funds, and conservation scientists like to study tigers, so one could argue that they have an incentive to prevent them from becoming extinct. By contrast, rural people living near tigers have to deal with threats to their livestock and children, and human-tiger conflict is a serious problem over most of the wild tiger's range. Rural people have less of an incentive to conserve tigers, especially when offered large sums of money for tiger carcasses. There is a mismatch between who pays the costs and who gets to benefit from tiger conservation.

Q: How can tigers become assets instead of liabilities?

A: Right now most wild tigers are typically "owned" by governments, but that is a weak and dispersed form of ownership, which does not benefit or incentivize specific people who control the wild tiger's destiny. By creating stronger property rights—i.e. more direct ownership of tigers—one could create ways for more specific groups,



Gilles Duranton and I recently examined the effect on traffic of changes in transportation infrastructure in U.S. cities. We found that expanding either road or transit networks is unlikely to reduce traffic congestion. In spite of this, carefully selected improvements to the highway network probably do pass a cost-benefit test, as does an across-the-board expansion of bus service. In addition, our results suggest that small tolls, tied to specific times of day, are likely to dramatically reduce traffic congestion. Finally, because about one-third of U.S. carbon emissions from energy consumption results from road travel, our findings illuminate an important link between infrastructure investments and carbon emissions.



Reductions in travel time caused by an average highway expansion are not sufficient to justify the expense of such an expansion.



A FUNDAMENTAL LAW OF ROAD CONGESTION

To understand the effect of transportation infrastructure on traffic in cities, we assembled data describing the road network and travel behavior in all U.S. metropolitan areas containing interstate highways for 1980, 1990, and 2000. These data suggest a fundamental law of road congestion: Adding 10 percent more lane miles to a city increases vehicle miles traveled by 10 percent. That is, in less than 10 years, new roads cause traffic increases directly proportional to the increase in capacity. This law appears to hold for major urban roads, nonurban interstate highways near major cities, and urban interstates.

The additional traffic caused by a new road has three principal sources. Of these, an increase in driving by current city residents is the most important. In addition, a 10 percent increase in the extent of the interstate network appears to result in about a 20 percent increase in truck traffic (the increase in truck traffic is less important for other roads). We also find that people migrate to cities

well provided with roads. Surprisingly, new roads seem not to cause substantial decreases in traffic on old roads.

We also examined the relationship between public bus service and vehicle miles traveled. Changes in a city's stock of buses have no measurable effect on traffic in the city. Increases in the supply of public transit appear to operate in much the same way as road capacity increases do: Every person who gets out of their car and onto a bus creates some extra capacity on the road (the capacity they used previously). This sort of increase has exactly the same effect as increases in the extent of the road network: in less than 10 years it is filled up to its initial level. This suggests that adding public transit increases the ability of existing roads to produce person travel miles but does not reduce *vehicle* travel miles.

WHEN ARE INVESTMENTS WORTHWHILE?

Other researchers sometimes assert that if roads induce demand for travel, then building roads is bad



policy. To understand the flaw in this reasoning, consider an analogous statement about shoes: “If we make more shoes then people will wear every pair, therefore we should not make them.” In fact, the decision to make more shoes ought to hinge on how much it costs to make them and on the benefit accruing to their wearers. So too with roads. To calculate the benefits of new roads, we estimate the relationship between the demand for travel and the speed of this travel. Because one of the main costs of car travel is time, this demand relationship reveals what people are willing to give up (time) to accomplish a given amount of travel.

Our research tells us that the amount of automobile travel in a city is very sensitive to the time cost of this travel: People are willing to give up a lot of travel for a small reduction in their travel time. This finding is important for two reasons. First, it implies that the value of reduced travel time associated with a modest across-the-board expansion of the

communities or agencies to control and benefit directly from tigers. Ways to benefit could include genuine “adopt-a-tiger” schemes, contractual agreements with local people, tourist viewing, and possibly trophy hunting (although this is currently banned). This would give tigers much greater asset value.

Q: On your new website, rhino-economics.com, you explore the incentives for poaching, can you explain?

A: In Africa there is still abundant rhino habitat so the principal threat is from poaching for rhino horn. Rhino horn has been used for several thousand years as a key ingredient in traditional Chinese medicines to treat toxicity, inflammation, and fevers. This means that the rhino horn trade ban simply drives up prices and therefore raises the incentives for poaching.

Q: What role does hunting play in rhino conservation?

A: Legal white rhino hunting started in South Africa in 1968. At the time there were only 840 white rhinos in the country. Today, rhino trophy hunts make a significant contribution to the South African economy and last year they counted 18,780 rhinos, of which 25% were privately owned. The value of a live rhino has soared during this time, making rhino breeding a highly lucrative business, not only for private owners but also for the state parks who sell their surplus rhinos to the private market.

Q: What is CITES and what has its effect been on rhino and tiger conservation?

A: CITES is the United Nations Convention on International Trade in Endangered Species. It is an international treaty that seeks to prevent the overexploitation of species by regulating wildlife trade between countries. My work suggests that the CITES bans may be having perverse effects on the rhino horn market (and possibly tiger bone market too), by causing a supply constriction which drives prices up to artificially high levels, stimulating sophisticated poaching and illegal trade activity involving organized crime cartels. CITES attempts to regulate the trade of thousands of different species across thousands of international border crossings – it is ambitious to the point of being absurd.

For this reason, I believe the option of legal trade must be investigated, particularly in the case of rhinos, whose horns can be easily and sustainably harvested without harming them.

**“Time of day”
congestion charges will
have large impacts on
travel behavior.**



interstate highway network will probably not be equal to the costs of such an expansion. (The possibility that road investments will be justified by other benefits, such as allowing the city to grow beyond its current level, is a subject of current research.) Second, that the demand for car travel is sensitive to the price of this travel suggests that charging drivers a small fee to access roads at congested times should be expected to have a big impact on their demand for travel.

The fact that public transit does not reduce road travel also does not imply that buses do not make cities sufficiently nicer and more productive to justify its cost. We investigated the effects of changes in a city's stock of roads and large buses on population and employment, and it appears that across-the-board improvements in bus service easily generate enough benefits to cover their costs.

POLICY IMPLICATIONS

First, two commonly suggested responses to traffic congestion—expansions of the road and public transit network—do not appear to have their desired effect: Road and public transit expansions should not be expected to reduce congestion. Second, traffic levels do not help to predict which cities build roads. Therefore, new roads allocated to metropolitan areas on the basis of current rules are probably not built where they are most needed, which suggests that more careful reviews of highway expansion projects be required. Third, reductions in travel time caused by an average highway expansion are not sufficient to justify the expense of such an expansion. Whether or not other benefits of these expansions may justify their expense remains unresolved. In any case, expansions of the bus network are more likely to pass a cost-benefit test than expansions of the highway network.



Q: What can environmentalists in the Western world do?

A: Donors can be more discerning about where their money goes! Many environmental groups claim to be saving the tiger, yet wild tigers keep declining. Those groups should be held accountable by their donors, and if they don't perform they shouldn't be rewarded further. Effective conservation measures are the ones that incentivize local people to protect rhinos, tigers, and their habitat—that is money and effort well spent. Conversely, there is much ineffective action (such as endless meetings, aimless scientific research consultancies, and media campaigns) that does not deserve support. The larger diversified multinational organizations are especially guilty of this.

Q: What implications does your work have for wildlife management in Africa?

A: Market solutions have been emerging naturally in South Africa for some time. It is especially interesting to contrast the experience of South Africa versus Kenya. South Africa had almost no wildlife in 1900—it had almost all been hunted to extinction. A few private reserves and state parks slowly built up wildlife numbers and, then from the 1960s markets were progressively opened. Today there is a thriving commercial wildlife industry comprised of tourism, trophy hunting, and game ranching. Twenty-three percent of South Africa's land is under conservation management and of that 17% is private. Estimated numbers of game have risen from 575,000 in 1964 to more than 18 million in 2007. Contrast this with Kenya, which banned hunting in 1977 and has lost between 60 and 70% of its large wild animals since then!

Q: What is the biggest challenge facing the trade of wildlife and is there a role for free market environmentalism?

A: The biggest challenge facing the trade of wildlife is the lack of appropriate institutions such as clearly-defined, strong property rights and related market incentives. Because of this, conservationists resort to very weak 'second-best' solutions: restrictive trade measures and even bans which are costly to monitor and enforce. There is definitely room for institutional reform—to create property rights first and then establish appropriate markets, so as to create better incentives for self-regulation.

Finally, we found that the demand for vehicle miles traveled is very responsive to price. This suggests that small "time of day" congestion charges will have large impacts on travel behavior. That is, unlike expansion of road or public transit networks, which do not appear to reduce traffic, congestion pricing should be expected to do so.

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ECONOMIST, n. a scoundrel whose faulty vision sees things as they really are, not as they ought to be. —*after Ambrose Bierce*

PROPERTY RIGHTS IN LAND

Property rights are essential for market exchange. The definition of those rights, their enforcement, and their transferability all help determine the extent of trade and the rate of economic development and wealth creation. Recent research by Gary Libecap and Dean Lueck (2011) reveals how the methods of demarcating land boundaries affect both the value of land and the course of economic progress.

There are two methods of demarcating land and thus establishing the physical elements of property rights in it: metes and bounds (MB) and the rectangular system (RS). Under the MB system, individuals define land parcels in such terms as impermanent natural features (rocks, trees, streams), structures (walls, monuments), and adjacent properties (beginning at the southwest corner of Peter Hill's ranch). This decentralized system, which has existed for millennia, is the most prevalent in the world, requires no central direction, and typically yields irregularly shaped parcels that conform to the circumstances of local topography and early settlement.

The rectangular system, used by the Romans and revitalized by the 18th century emergence of modern survey methods, now begins with the establishment of a precise initial "point of beginning" and its associated principal meridian of longitude and parallel of latitude. All property boundaries are defined by reference to this initial grid point. The system requires a centralized decision for its creation and implementation yielding land parcels that are squares or collections of squares.

The metes and bounds system leads to parcels that conform closely to local topography, thereby enhancing the productivity of the land. Implementation requires no specialized surveying instruments or technical knowledge. In contrast, the advantage of the rectangular system is that a person a world away can understand the shape and location of a parcel

simply by its description relative to the reference grid. Such understanding of an MB-demarcated parcel, by contrast, may require highly idiosyncratic, localized knowledge of the shape of adjoining property, or a stream, or even the location of a particular tree.

Early American settlers brought the MB system with them from England, and its use dominated land demarcation in the thirteen colonies. To more easily dispose of federal lands in the western territories, the Land Ordinance of 1785 ordered that the rectangular system be implemented throughout the rest of the United States. A portion of central Ohio called the Virginia Military District (VMD) was already slated to be demarcated using metes and bounds, but the surrounding portions of Ohio were laid according to the rectangular system. Libecap and Lueck focus their study on the VMD and its environs, enabling them to examine the impact of land demarcation while controlling for other factors, such as location and soil fertility, that might also shape land use decisions and values.

The authors find that the standardization benefits of the rectangular system clearly outweighed the metes and bounds benefits of topographical conformation. Hence the value of a typical plot of land in central Ohio was raised by 20 to 25 percent if it was RS-demarcated rather than MB-demarcated. The net effect of the rectangular system varied considerably, depending on the ruggedness of the terrain.



On flat ground RS raised property values by at least 30 percent, but on rugged terrain the advantages of this system could shrink to zero or even turn negative. The rectangular system was thus a superb means of demarcating property in the relatively flat expanses of the Great Plains, but in mountainous (or otherwise topographically idiosyncratic) areas RS has the capacity to diminish the value of property because it forces “one shape fits all.”

Libecap and Lueck show why, on balance, the rectangular system raised land values. The greater precision afforded by the system dramatically reduced property boundary disputes, and also substantially increased the liquidity (or marketability) of land. People were willing to pay more for RS-demarcated land because they could later sell it more easily and because in the interim their ownership status was far less likely to be challenged by their neighbors.

The authors also examine the long run consequences of property demarcation. They find that the RS-induced enhancement to land values persists today, with the gap between RS and MB land values actually increasing during the 20th century. By making land more readily marketable and less subject to legal dispute, the rectangular system encouraged more immigration by settlers and also accelerated the conversion of farmlands to more valuable commercial, residential, and industrial uses. Urbanization also proceeded more rapidly in those areas with the rectangular system.

Although the rectangular system was imposed by the federal government, something like it conceivably might have emerged spontaneously as surveying costs fell in the 18th century, just as railroads privately decided to standardize their track gauges. Nevertheless, the rectangular system relied on the initial creation of a reference grid system on a vast scale, something that would have been difficult—if not impossible—for any private party to implement.

The episode illustrates two key points. First the definition, enforcement, and transferability of property rights play a key role in wealth creation and economic development. Second, when it comes to the establishment of property rights systems, it appears that there may be an important and productive role for government to play—a phrase not often uttered in this column.

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Little Green Lies

BY JEFF BENNETT

White lies are well-meaning and innocuous. When we tell them, we feel justified or excused—a subtle moment of dishonesty that promotes a better, kinder world. But not all little lies are white. Some are green.

We read and hear “little green lies” everywhere: “we are running out of landfill space,” “population growth must be controlled,” and “economic growth and the environment are incompatible.” They are becoming as common as white lies, but their effects can be very different. Many of these perceived environmental threats are simply misunderstood, at best, or deliberately misleading, at worst. Such lies deserve closer scrutiny so that their significance in directing environmental public policy can be better understood.

AGRICULTURE VERSUS ENVIRONMENT

Consider the following little green lie: Modern agricultural practices always conflict with the environment. Environmental advocates, including groups such as Greenpeace and Friends of the Earth, try to convince consumers to buy organic or nongenetically modified food—or, better yet, to grow their own. But is this type of agriculture more environmentally friendly than modern



Unlike white lies, little green lies are not harmless. Revealing the truth about little green lies will make society as a whole better off.



The **PERColator** is dedicated to exploring the notion that environmental quality is best defended by property rights and markets.

Join the conversation at percolatorblog.org



Assessing Endangered Species Science

By [Jonathan H. Adler](#) 5 Comments

Species conservation is not—and cannot be—a wholly scientific exercise. Whether a given species is at risk of extinction may be a scientific question, but what to do about it is not. [\[Read more at percolatorblog.org...\]](#)

Rights-Based Fisheries Management

By [Shawn Regan](#) 7 Comments

PERC's latest workshop begins this week on the lessons learned in rights-based fisheries management. Fisheries experts from around the world have arrived to discuss the most recent research on rights-based approaches to fisheries management. [\[Read more at percolatorblog.org...\]](#)

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agriculture? Not necessarily. Herbicides, for example, allow minimal tillage farming that reduces soil erosion, and genetically modified (GM) crops require fewer insecticides. But advocates believe that they are preventing people from harming the environment and themselves if they can instill the little green lie.

Little green lies may also be good for their tellers. If more individuals believe the agriculture-versus-the-environment story and buy organic, GM-free food, the environmental advocates are better off because they see more people contributing to the achievement of the environmental goals they hold dear.

A proponent may also be an organic farmer whose produce will be in higher demand if organic food is embraced by consumers. The belief that organic food trumps competing conventional food, despite a higher price, generates an improvement in organic farm income and wealth.

If little green lies are believed by the broader public, then their promulgators may also be able to secure public

policy goals that further satisfy their own preferences, but often at the expense of others. Some environmental advocates, for example, try to convince members of the public and their political representatives that conventional agriculture causes environmental harm. If their lobbyists are successful, then the political process will generate more and more policy outcomes forcing a switch from conventional to organic farming. This makes proponents happier and gives them more of a reason to spread the little lie.

But there are costs associated with spreading green lies. If the political force generated by the agriculture-versus-the-environment lie is sufficiently strong, farmers may be prevented from using herbicides. An herbicide ban would mean reduced farm profits. A few farmers may even go out of business. People would also have to pay more for the food that would have otherwise been produced more cheaply using herbicides. The higher price of food is a cost, but one that is spread across the whole of society. If spread thinly enough, people are more willing

If little green lies are believed by the broader public, then their promulgators may also be able to secure public policy goals that further satisfy their own preferences, but often at the expense of others.



to bear their small share of the costs—given their newly formed perceptions of herbicides. In short, the more the costs of little green lie policies are dispersed throughout society, the less likely they will be challenged.

LITTLE LIES—BIG BANG

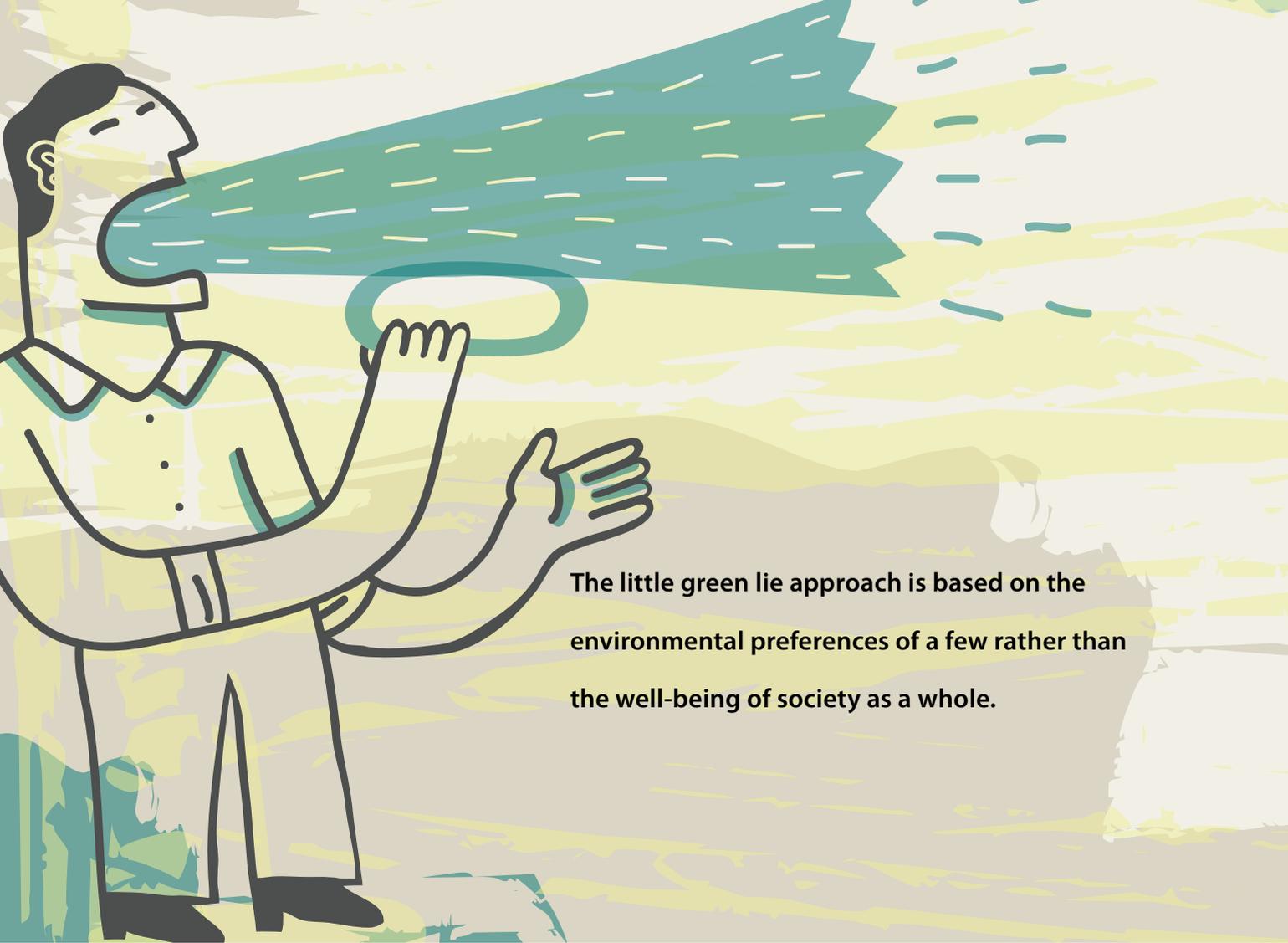
The little white lies analogy suggests that everyone will be better off if we just let little green lies go past without correction. But this is where the analogy ends. Unlike white lies, little green lies are not harmless. Revealing the truth about little green lies will make society as a whole better off.

Exposing green lies and preventing or reversing public and private decisions that flow from them would make their advocates worse off. The special interests that are advanced by the acceptance of the little green lies would be set back. But the well-being of the public, who would otherwise bear the costs of the little green lies, would be improved.

The analogy with little white lies is also on shaky ground in terms of whether or not the teller knows it is a lie. Those who advance little green lies may not be aware of their position's lack of veracity and may be convinced that they are acting for the greater good. An organic food advocate, for example, may see a field that has been sprayed with herbicides and conclude that it must pollute the soil and rivers. He or she may decide then that the higher prices of organic foods are worth paying.

There are two specific problems associated with the process used to come to that conclusion. First, the individual's concerns about the "pollution" caused by the use of herbicides may not be shared by the majority of the population. Second, the understanding of the impacts of choosing organic foods over conventional foods may be limited to a single dimension—the pollution perceived to be associated with the use of herbicides.

These two problems can be generalized as follows. First, the little green lie approach is based on the environmental preferences of a few rather than the well-



The little green lie approach is based on the environmental preferences of a few rather than the well-being of society as a whole.

being of society as a whole. Second, it is focused on single issues and so misses the big-picture consequences of the actions taken.

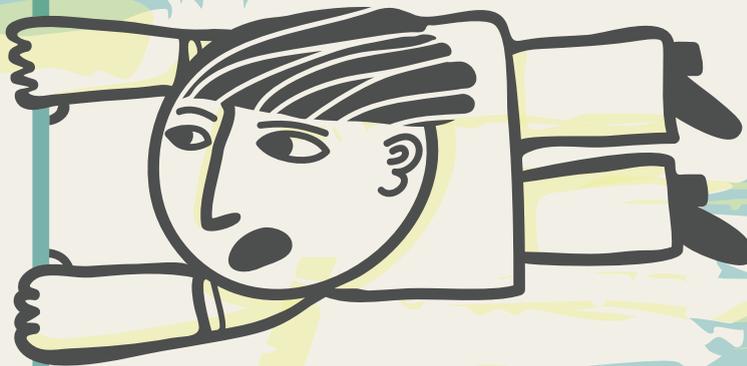
The first characteristic is problematic because a conclusion and its policy outcome, drawn on the basis of the preferences of an individual or a specific interest group within society, may be detrimental to society as a whole. The little green lie teller knows his or her own preferences for the environment, but can't say with certainty what the rest of society thinks about the environment. Yet those promulgating little green lies try to convince the broader community that their preferences are the right ones when they set out to publicize their environmental viewpoint. If successful, they impose their preferences on others, even though their gain from doing so may be overwhelmed by the aggregation of the losses endured by those who do not share those preferences.

The second characteristic is problematic because the concentration on a single dimension of an issue can deliver perverse outcomes. Society and the environment

form complex interdependent systems. Key features of such systems are the feedback loops that can accentuate change or contradict it. The implications of change are rarely straightforward. Concentrating on a single dimension of change is inadequate and potentially harmful to society. A ban on herbicides, for example, would lead to more mechanical cultivation of the soil to reduce weed infestations of crops. More tillage means more loss of soil structure and a greater risk of increased soil erosion.

The logical strategy to avoid the problematic characteristics of little green lies is to adopt an analytical stance that is based on a societal perspective. This process involves looking beyond the immediacy of an environmental issue. It means taking into account the many dimensions across time and space that characterize the interface between society and the environment.

Taking a "societal" perspective necessitates an understanding of society's preferences, which are hard to observe. The difficulties are especially vexatious in



Every day we face a barrage of information with little opportunity for quiet contemplation of the various pieces presented to us. This is particularly true with green issues.

the area of the environment because there are limited windows through which these preferences can be observed. For society, people's preferences are revealed in what they buy and sell. But for environmental goods and services, there are few markets in which community-wide preferences can be seen. Put simply, the truth is out there but it's hard to pin down.

Despite the difficulty in defining society's preferences, it doesn't mean we should simply accept little green lies. Every day we face a barrage of information with little opportunity for quiet contemplation of the various pieces presented to us. But such contemplation is important because all that glitters is not gold. This is particularly true with green issues. Views on the environment are often strong and emotional—especially when the survival of species and the well-being of future generations are perceived to be at stake.

If one can push the emotions to the side, however, it becomes clear that little green lies are potentially counterintuitive in terms of their environmental

consequences. This is because of their inappropriate focus on just one dimension of the issue at hand and because they are typically based on the preferences of an individual or a specific interest group. If taken to their logical policy conclusions, such lies can be counterproductive for the environment and society as a whole.



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FISHING FOR AN ANSWER

Ocean fisheries around the world are in trouble. Adri Bout of the Netherlands had fished the North Sea for 25 years. He knew there were too many boats competing for too few fish, so he decided to tackle the problem on land. Today, he raises 100 tons of turbot a year in eight-story fish high-rises of his own design.

Modern fish farms got started about 35 years ago on a small scale and have since exploded into an industry that provides half the fish on the worldwide market. Despite the growth of this industry, farmed fishing has had some serious and persistent problems such as unsanitary conditions, disease epidemics, lice, weakened genes, pollution of surrounding waters, and poor tasting fish.

Bout knew what he was facing, but he also knew that the demand for fish was rising. If someone could figure out how to do it better, there was money to be made. Bout poured his time, money, and ingenuity into his project—and lost thousands of fish as he perfected the technology.

Eventually, he decided to focus his efforts on turbot, considered a delicacy by many and served in fine restaurants. He gave the fish plenty of space; clean, circulated, and filtered water; and cold temperatures to discourage the growth of bacteria. He also reduced his energy costs—a problem at many fish farms—with the use of gravity. By building his farm vertically, he can pump water to the top level and let it flow downward through the eight stacked fish tubes. At each level, it is filtered before flowing into the next tube. Disposing of the untreated waste without flushing it into the sea has turned out to be a profit-making venture of its own. Bout oxidizes the waste to sell as plant food.

Bout is excited about the success of his project, but he is anxious to move on to the next. With more resources available to him now, he is planning to raise sole—for a bigger profit.

For more information visit: www.seafarm.nl



GREEN LOANS

Kiva, one of the pioneers in the microfinance industry, has added a new category to its loan program: green loans. The loans will apply exclusively to low-income entrepreneurs around the world who want to invest in cleaner, more energy-efficient resources and materials. Unlike other Kiva loans, they will be available to businesses as well as individuals.

The overall aim of green loans is to save costs on commonly used resources like fuel and electricity. In developing countries with poor infrastructure, getting electricity to remote areas can be impossible, and accessing kerosene and gasoline is both difficult and inefficient.

With green loans, people are buying solar lanterns and installing solar panels on the roofs of homes and businesses. The energy brings light to extend the work day and improve productivity. In turn, the borrowers are able to raise their standard of living and earn enough money to repay their loans. Kiva has a loan repayment rate of 98 percent, unlike some microfinance groups that have failed because of lax lending policies.

Other borrowers are purchasing high-efficiency cookers and low-propane gas stoves to replace wood and other materials used for cooking and heat. Much of the developing world spends hours every day gathering wood, losing precious time for other activities, and perhaps inadvertently damaging the environment.

Already, the loans have made it possible to insulate a home in Mongolia, bring light to a hut in Kenya, and allow a taxi driver in Brazil to switch his gas-guzzling engine for a more efficient one. These improvements will help the borrowers climb out of poverty, while repaying their loans and improving the environment.

For more information visit: www.kiva.org



CARBON FOR WATER

A Swiss company is donating its ingenious water filter to impoverished villagers in western Kenya while also turning a handsome profit. Making money while giving away your products is counterintuitive, but it is working. If developed to scale, this business model could be a game-changer for developing countries.

Mikkel Vestergaard Frandsen is the 38-year old CEO of a family company that has made work clothes and disaster supplies for more than 50 years. Water filters are a new addition to the product line.

The company's first water filter, Lifestraw, was designed for individuals to carry with them. It was followed by a larger, easy-to-use model for families. Pour dirty water in the top, and clean water comes out at the bottom. So clean, it meets EPA standards for drinking water.

Initially, Frandsen relied on donations and government support to pay for the filters, however, the 2008 recession meant he had to find other funding. As he was casting about for elusive financing, carbon credits came to mind, and Frandsen connected the dots between firewood and clean water.

Typically villagers in Kenya purify their water by boiling it over a fire. With Lifestraw, they no longer have to burn firewood, and by burning less wood, they reduce their carbon emissions—all of which qualifies Frandsen for carbon credits now being sold by J.P. Morgan.

The reduction in carbon emissions must be documented for certification purposes, thus the company has hired 4,000 community health workers and 4,000 drivers to distribute the filters, teach families how to use them, and photograph each site. Hundreds of other workers will be hired to build repair centers and check homes to make sure the filters are being used. The filters can clean 18,000 liters of water, which is the average amount needed for a family of five for three years.

In addition to clean water and carbon offsets, the company reports that it has provided thousands of new jobs and improved the health of women who suffer from respiratory diseases connected to the smoke from indoor fires.

Frandsen invested \$30 million in the water filter project. The company is now earning 2 million carbon credits a year that can trade from \$6 to \$12 each. With a 10-year commitment to repairing and replacing the water filters, Frandsen's company stands to make its investment back many times over and do a world of good.

For more information visit: www.vestergaard-frandsen.com/lifestraw



PAYING THE BILL FOR ENVIRONMENTAL LITIGATION

In the United States, federal agencies will pay you to sue them. Or, more precisely, they will cover your attorney's fees and other litigation expenses if you win your case and satisfy certain eligibility criteria. Such is the mandate of the Equal Access to Justice Act, a paradoxically named law passed by Congress in 1980.

The name is paradoxical because the Equal Access to Justice Act (EAJA) only applies to a subset of all plaintiffs, namely, tax-exempt organizations and plaintiffs whose net worth falls below certain categorical thresholds. All other plaintiffs must pay their own attorney's fees regardless of the litigation's outcome.

If this law sounds like a windfall for plaintiff's attorneys, it is. An August 2011 study by the Government Accountability Office reported that between 2003 and 2010, the Treasury Department paid \$14.2 million in attorney's fees just to those plaintiffs suing the Environmental Protection Agency. The total for all agencies is unknown but estimated in the tens of millions annually.

If the law also sounds like a departure from the normal workings of our nation's justice system, it is. The one-way fee-shifting arrangement (a federal agency cannot recoup its attorney's fees from losing plaintiffs) is one of very few exceptions to the American rule of requiring each party in a lawsuit to bear its own legal expenses.

Surprisingly, the loudest cries for reforming the EAJA are not focused on the law's enormous cost or exceptional nature. Rather, it is the alleged abuse of the Act by litigious environmental organizations that has drawn the ire of industry groups and Republican legislators.

According to Senator John Barrasso, "we have seen for years radical environmental organizations abusing EAJA." Representative Cynthia Lummis singled out WildEarth Guardians, the Center for Biological Diversity, and Western Watersheds Project as "three organizations that are filing

constant litigation, that have cottage industries built up to fund their lawyers and their lawsuits against federal agencies."

The two Wyoming legislators are seeking to amend the Equal Access to Justice Act by extending the \$7 million net worth cap to tax-exempt organizations, limiting the number of awards to any one group to three per year, and capping the maximum award for each case at \$200,000. The bill, short titled the "Government Litigation Savings Act," also strives for more accountability by requiring federal agencies to report all EAJA payments to a searchable online database.

If enacted, these reforms will undoubtedly curtail the concentration of EAJA payments to a handful of environmental litigation shops. But they are unlikely to diminish the overall impact of litigation on the actions of federal environmental agencies because the proposed reforms fail to address the financial risk asymmetry created by the Act's one-way fee-shifting protocol.

As former chief of the Forest Service Jack Ward Thomas explained, "paying litigants to sue certainly encourages legal action." By contrast, requiring each party to pay their own attorney's fees, per the American rule, or requiring the loser to cover both parties' fees, per the English rule of two-way fee shifting, discourages frivolous lawsuits.

Congress should exempt environmental cases from the Equal Access to Justice Act or impose two-way fee shifting on environmental litigants. Either reform would reduce the expected payoff from suing federal agencies and, at the margin, make environmental policy less litigious.

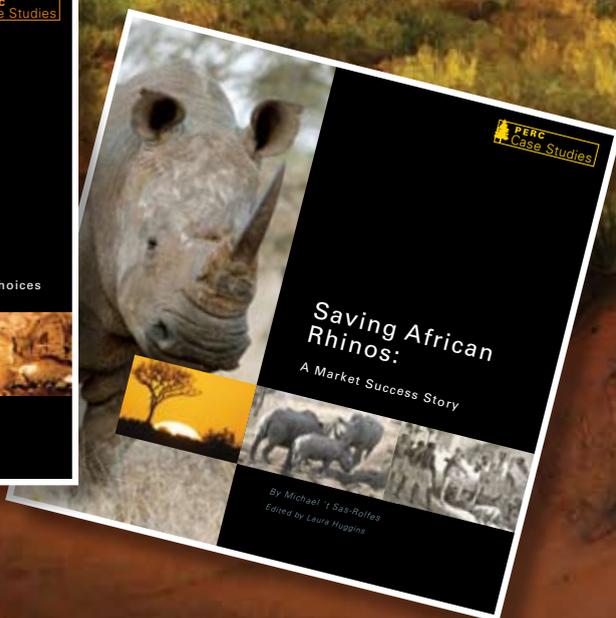
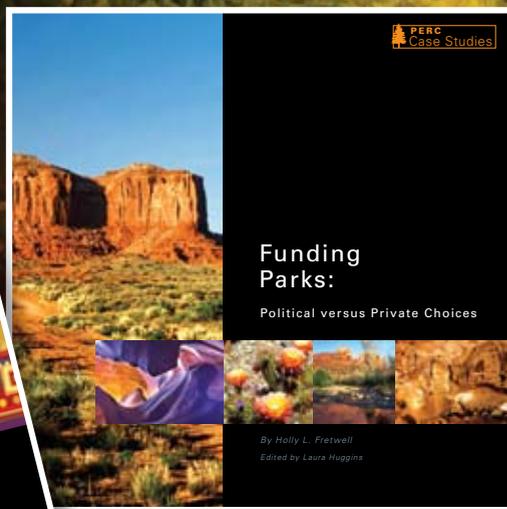
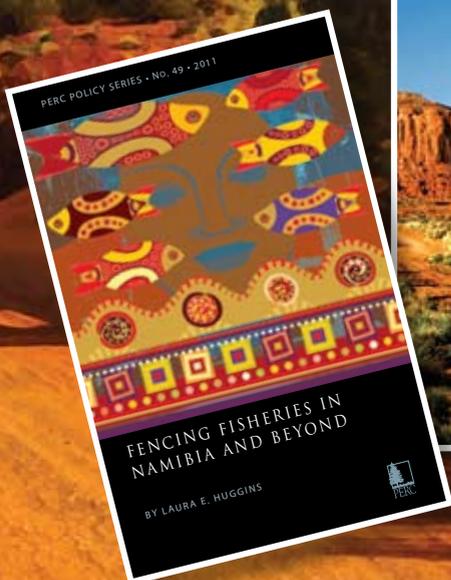


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