

## The Student Issue

Each summer a group of student fellows apply AIER's brand of unbiased, independent research to contemporary economic questions.

by Sarah Todd, Editor

**A**IER's summer fellowship program is a pillar of the organization's mission to inform and educate the public. Incoming and current graduate students in economics take courses taught by a wide range of respected scholars.

Lessons in sound money, methodology, and property rights reflect the Institute's core values.

The program has been a part of AIER since the organization's post-World War II move to the Berkshires. From the beginning, the goal has been to introduce the next generation of educators and opinion-makers to the nonpartisan, scientific methods of data analysis that are the trademark of this organization.

This *Economic Bulletin* presents a sampling of student fellows' work from the summer of 2011. Among the many fine research papers, issues relating to the environment, conservation, and land use emerged as prominent themes. This trend reflects the mindset of a young generation invested in thinking about effective ways to balance economic and ecological concerns.

Four student papers on environmental topics are featured in the following pages. Olga Bespalova, a returning student fellow pursuing a doctorate at George Washington

University, explores policies for pushing the electric power industry to use more renewable energy.

Max St. Brown, a PhD student at Washington State University, analyzes the drawbacks and benefits of a use-it-or-lose-it policy that requires water rights owners to either put water to beneficial use or lose their claims.

**The small selection of essays in this issue is the product of limited space. Students produced excellent work across the board.**

Another returning student fellow, Zachary Gochenour, a PhD candidate at George Mason University, wrote one of two papers about tax policy. Gochenour explains that site value taxes that assess the value of land without improvements may end up discouraging landowners from developing their property.

Steven Furnagiev of the University of New Hampshire's doctoral program takes a look at current use tax programs. These programs can include the value of certain improvements, but provide incentives that give landowners more freedom to choose whether or not to develop their land.

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space. Students produced excellent work across the board.

For example, Wisly Douyon of Oklahoma State University uses game theory to explain how governments spying on one another can actually help create a more stable international environment. Kaihua Deng, a University of Washington student who won one of AIER's prestigious Foulke awards, reviews Keynesian approaches to understanding the recent economic recession in the U.S. and considers the prospect of full-reserve banking as a solution.

Viviana Ehrenzeller, a returning student fellow who studies at the University of St. Gallen in Switzerland, argues that contingent convertible bonds—an oft-proposed solution to the too-big-to-fail problem—won't get the job done. Liam Clegg, another Foulke-award winner who is at the California Institute of Technology, finds that consequentialism in criminal law will only end up favoring the privileged.

Equally worthy of commendation were research papers by the other student fellows: Chenxi Cai, Wei Chen, Hedieh Shadmani, Matthew Baker, Avi Baranes, Melissa King, Will Luther, Alejandro Rivera-Mesias, Alexandru Roman, Alex Salter, and Sheida Teimouri.

## State Policies Can Cut Energy Dependence

Renewable Portfolio Standards requires the electric power industry to include renewable sources of energy.

by Olga Bespalova, George Washington University,  
PhD Program in Economics

**T**he United States' dependence on energy imports of fossil fuels has resulted in political and economic insecurity, as well as the depletion of natural resources and increased pollution.

In 2009, fossil fuels accounted for 78.4 percent of the U.S. energy supply. Petroleum constituted 35.3 percent of the energy supply, while natural gas was 23.4 percent and coal was 19.7 percent. By contrast, nuclear power and renewable energy amounted to just 8.3 percent and 7.7 percent of the energy supply, respectively.

Relying on fossil energy sources as the primary energy supply creates multiple problems. First, fossil fuel energy creates problems for which the public is not compensated, such as pollution and health issues. These problems are called negative externalities because the social costs needed to eliminate their negative impact are not included in the costs of energy generation and energy prices.

Second, an over-reliance on fossil fuel also leads to the tragedy of the commons, in which shared use of non-renewable resources results in the full depletion of those resources. Thus, the social costs of fossil fuel energy are higher than the private costs.

However, fossil fuel has historically had two major advantages over many alternative renewable energy sources: It is cheaper and easier to transport. Even with rising oil prices, it remains comparatively cheap today.

The Electric Power Research Institute predicts that in 2015, wind

energy will cost nearly one-third more than coal and 14 percent more than natural gas. Solar thermal electricity, the institute says, will cost three times the price of coal and more than twice the price of gas.

On the other hand, rapidly improving technologies are advancing the possibility of cheaper renewable energy in the future, while fossil fuels are becoming more scarce and expensive.

The global research director for General Electric, Mark M. Little, predicts that solar power may be

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cheaper than fossil fuel energy and nuclear energy within three to five years. Thus, the price ratio of renewable and traditional energy goes down, opening new opportunities for developers of renewable energy.

Although renewable energy production also creates negative externalities (wind farms cause noise, lower real estate prices in surrounding areas, and harm birds and fish), their scope is much smaller than those caused by the generation of non-renewable energy.

In addition, if landowners are compensated for the use of their land by renewable energy producers (i.e. wind farms), the size of the compensation offers a good estimate of social costs. In this way, negative externalities are corrected because renewable energy prices reflect the true costs related to its generation.

In order to help decrease dependence on fossil fuels and address

other energy concerns, the U.S. government is increasingly interested in renewable energy policies. The most frequent target of these policies is the electric power industry, which uses 38.3 percent of the total U.S. energy supply and more than half of the renewable energy supply.

The Renewable Portfolio Standard (RPS) is one of the most popular, and disputed, policies directed at the electric power industry.

The RPS requires companies to produce a certain percentage of their electricity from eligible renewable sources or to use renewable energy credits according to a specified schedule. As of March 2011, 29 states, along with Washington, D.C., have RPS requirements that are mandatory. Seven states have specific renewable goals, which, unlike RPSs, are not legally binding.

Critics of RPS policies dispute their effectiveness, particularly on the national level.

Michaels (2008) argues that a national RPS policy would be inefficient for pollution reduction because it "deals with only one of many sources of a pollutant": the electric power industry. Rossi (2010) argues that the difference in states' natural resources endowments would create different costs and benefits of RPS implementation, since some states would have more favorable natural conditions for renewable energy production than others.

It's true that a national RPS policy would arbitrarily set fractional goals for specific kinds of electricity generation. Such a policy would require that certain percentages of total energy production be generated from wind, solar, or biomass, without taking into account the differences in natural conditions between states. For some states, investments in specific renewable energies would be more costly than other measures of pollution reduction (such as energy efficiency), and thus, not effective.

But the data suggests that RPS policies can have a significant impact on renewable energy deployment if they have adequate enforcement mechanisms—specifically, established penalties for underachieving established fractional goals. Penalty features should be included in any RPS design to make it a strong and effective instrument of developing renewable energy.

To comply with the national RPS, these states would have to pay penalties or to buy renewable energy certificates from those states that are better endowed with natural resources—causing wealth redistribution from states with

fewer natural resources to states with greater resources.

By contrast, setting RPS policies at the state level allows each state government to consider local natural conditions and to create incentives to develop the least expensive and most effective renewable technologies.

Cory and Swezey (2007) argue that RPS policy could be effective at the state level if it included “noncompliance penalties, either in form of fines or an alternative compliance payment.” This would distinguish strong RPS policies from weak ones that allow “ambiguous RPS regulations or definitions” and “frequent or ma-

ior rule changes,” and have “weak enforcement mechanisms.”

From 2003 to 2009, only 18 states had active RPS policies that both established certain fractional goals and required compliance to those goals. However, on a yearly basis, just 40 percent of those states fully achieved those goals. Among these 18 states, 46.2 percent achieved 95 percent of the set goals, while 50.2 percent of the states met 90 percent of the goals.

To better enforce compliance, most of the 18 states have established penalties or alternative compliance payments. These have to be paid when a company does not achieve its RPS requirements

## Apply to AIER’s Summer Fellowship Program

**A**dmission to AIER’s Summer Fellowship Program is based on interest in current economic issues, plans for future study, and academic achievement. The Institute is particularly interested in students who aspire to teaching or other careers that have an impact on popular economic understanding.

Student fellows receive room and board plus a stipend that has averaged about \$500 for a two-week session. Those who successfully complete the program are invited to apply for an E. C. Harwood Fellowship for study in an accredited graduate degree program for the following academic year. In recent years, awards have averaged between about \$1,250 and \$2,500 per student.

Student fellows participate in intensive seminars structured to encourage a disciplined exchange of views. Returning student fellows work on projects of their own choosing and present their research at the end of the program.

In 2012, AIER intends to sponsor two sessions at its 100-acre campus in Great Barrington, MA.

- The first session will run from Monday, June 11, to Friday, June 22.
- The second will run from Monday, July 16, to Friday, July 27.

Candidates for the fellowship must submit a completed application form, curriculum vitae, personal statement, writing sample, outline of a proposed course of study and career objective, official transcript(s), and at least two scholastic references.

Applications are expected to be available January 17, 2012.

### For more information contact:

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either through energy production or through purchases of renewable energy certificates from other generators.

On average, the penalty was \$27.93 for each megawatt hour of renewable energy that a company fell short of meeting its RPS, but the range is considerable. Some states have penalties as high as \$40 to \$63 per megawatt hour; others did not have penalties. (A megawatt hour is the amount of energy consumed if one million watts are used for one hour, or if one watt is used for one million hours.)

Empirical results show that penalties have a significant impact on the probability that a given state will comply with its RPS target. A \$1 increase in the penalty (say, from \$50 to \$51 per megawatt hour) raises the probability that a state will comply with its RPS compliance by

48 percent.

With that penalty increase, the percentage of states achieving full compliance with RPS policy goals would increase from 40 percent to 59.2 percent—a very significant result. Similarly, an increase of one more dollar per megawatt hour raises the probability that states will comply to 95 percent of RPS goals to 49.5 percent from 46.2 percent. The probability that states will comply to 90 percent of RPS goals goes to 61 percent up from 50.2 percent. Across the board, higher penalties produce better compliance.

States with higher levels of carbon dioxide pollution are also more likely to comply with RPS policy goals. From 2003 to 2008, the average pollution level in the 18 observed states was 125.74 million metric tons of carbon dioxide. The

least polluted states had 10 million metric tons, while the most polluted had 402 million metric tons.

All other factors being equal, one million metric tons more of carbon dioxide pollution increases the probability that a state will fully comply with its RPS policy from 40 percent to 43 percent. These results indirectly confirm that states that choose to adopt RPS policies are driven by environmental concerns, along with other reasons.

The impact of RPS policies on investments in renewable energy, employment, and pollution level is yet to be estimated. But there is no doubt that RPS policies can be used in conjunction with other policy instruments to decrease U.S. dependence on energy imports and fossil fuel production and to help the country move toward a more sustainable future.

## The Paradox of Use It or Lose It

A water rights requirement popular in the West is meant to discourage wasteful use. But it doesn't always work that way.

by Max St. Brown, Washington State University

**T**he water rights of much of the Western United States include a requirement of use it or lose it. Under this requirement, if an existing water right is not put to beneficial use for a period of years, that right will be forfeited and become available to other users (Huffaker 2005).

Use it or lose it is intended to discourage the wasteful use of water. In practice, it might do just the opposite.

Farmers risk losing their water rights if they do not put all of their water to use, as noted by Brewer, et al. (2007). In order to avoid losing the unused portion of their right, farmers have an incentive to put all of their water on crops regardless of whether it is needed. As a result, farmers are unlikely to conserve.

In addition, use it or lose it can be inefficient in cases where users do not want to permanently trade water rights. In a given wet year, for instance, farmers do not want to permanently trade away water rights because they will need them again in dry years. As Zellmer (2008) points out, a solution to this issue exists in the form of water banks that allow farmers to give up their water for a year without permanently losing their rights.

In response to such concerns, Huffaker recommends removing use it or lose it from the prior appropriation doctrine. The doctrine, which was first created to define how water rights are allocated and managed in Colorado and California, helped promote rapid economic development of the American

West. Unlike the riparian law used in much of the Eastern U.S., the doctrine does not tie water rights to land ownership. Instead, the first claimant to put water to beneficial use gains senior rights.

While removing use it or lose it will do away with the perverse incentive to avoid water conservation, a water rights doctrine that lacks the requirement can bring about problems of its own.

If the requirement were removed from the prior appropriations doctrine, non-water users—including speculative trading firms and potential monopolists—could obtain rights for future use or resale rather than for actual and current use.

Zellmer (2008) notes that this kind of privatization would place water “in the hands of profit-driven firms, thereby interfering with the ability of residents and local governments to manage their own supplies, as decision-making becomes less transparent and opportunities for meaningful participation become less available.”

Speculative trading firms could facilitate transactions of water and promote the transfer of water rights. However, there is significant potential for market manipulation.

Imagine that a speculative investment bank purchases all available water rights from a river next to the most fertile land. With monopoly power, the speculator might demand higher prices. Farmers might then seek out lower-priced water rights adjacent to less fertile land.

Farm production is harmed because the most fertile land sits undeveloped. When the land finally is developed, its purchase price will include the inefficiencies of overpricing by a monopoly. Laws preventing too much market power would discourage possible monopolies.

Opening up water rights to speculation might mean lost opportunities for current water use. Zellmer explains that in Chile, which does not have a use-it-or-lose-it requirement, water is traded as a commodity. Some argue that hydropower projects there bought

large quantities of water on a speculative basis, preventing other entrepreneurs from obtaining the necessary resources to start a competing water use.

Seemingly, with open markets competing, users could just pay the hydropower project for temporary use of water rights until a dam is built. However, if transaction costs such as legal fees to write up a rental contract are high, then there is no guarantee that rights will be in hands of the party that can put the water to its most beneficial use. Without a use-it-or-lose-it clause, there is nothing to prevent the hydropower project—or anyone else—from hoarding water rather than letting the water go to beneficial use.

Chile has since amended its water code in 2005 to include a tax on unused water rights. The tax provides an incentive for unused water rights transactions. This solution holds best for large-volume water claims where water cannot be “used” wastefully and go undiscovered.

Small-scale wasteful uses, such as using water on farmland regardless of whether it is needed, might still go undiscovered.

California may have struck upon a solid solution to the paradox of use it or lose it. Prior to 1977, a water rights holder could lose the portion of his or her right if it went unused for five years. Since then, Section 1011 of the California Water Code has been introduced to allow the temporary transfer of water rights without its forfeiture, thus eliminating the incentive to avoid water conservation. Likely in an effort to keep out speculators, California’s Water Code prevents non-water-users to make water claims.

The overall effect of the removal of use it or lose it is a trade-off between the beneficial effects of conservation and the harmful effects of speculation. When the requirement effectively prevents speculation and promotes the transfer of water rights to more beneficial uses, use it or lose it makes economic sense.

## An Alternative to Property Taxes

Proponents of the land value tax say it encourages business. Economic theory predicts another outcome.

by Zachary Gochenour, George Mason University

In 2008, property taxes represented 28 percent of revenue for local governments in the United States, totaling \$400 billion. These taxes are the principal source of local governments’ revenues, dwarfing income and sales taxes.

Most of the policy debate about property taxes is concerned with marginal, or incremental, changes to the status quo—for instance, whether the government should charge an additional 1 percent tax to pay for a new school. But in this time of extraordinary budget deficits for local governments, many enterprising politicians are considering

fundamental changes to the ways taxes are assessed.

One such proposal, linked closely to 19<sup>th</sup>-century American economist Henry George, is to modify the way land value is assessed for taxes. Currently, property taxes are based on the estimated value of both the land and improvements on the land (such as buildings and other personal property).

Under the alternative system, a land value or site value tax, the landowner pays taxes only on the estimated value of a plot of land, *excluding* the value of physical buildings, landscaping, or other

site improvements.

Consider a gas station at a busy intersection that sells for \$2 million. The tax assessor might find an empty lot on a very similar corner that sells for \$500,000, which would be the site value.

Under the usual property tax system, the gas station owner would pay taxes on the \$2 million value. But under the site value system, both the gas station owner and the empty lot owner would pay taxes only on the \$500,000 value.

The proposal for site value taxes has two overlapping justifications: one based on morality and social justice, another on economic efficiency. The moral argument, which George focused on, builds on the idea that land value is the “common heritage of mankind” and belongs to the community, whereas improvements are a product of individual labor and rightly belong to the individual.



The economic argument in favor of the site value tax is that it increases economic efficiency because it encourages landowners to upgrade their land through physical improvements that will not be taxed. And because site value taxes are taxing community-created value, they will not drive away business and further development as new taxes might. In the Georgist theory, site value taxes allow local governments to raise taxes while actually encouraging development, or at least not suppressing it.

Site value taxes are already implemented to a limited degree in many American communities, particularly in the mid-Atlantic region where Henry George's ideas were most influential. Connecticut also has given the system serious consideration, and Ireland is planning a major nationwide site value tax.

The land site tax sounds good in theory. But it may not work well in practice.

Public goods—that is, goods that present prohibitive costs for keeping people from enjoying benefits without paying—are assumed to be underprovided by the market. This is because the producer of public goods will not be fully compensated for the benefits they provide.

The simple solution is to finance those goods through taxes.

But many taxes actually decrease overall production in the economy, mostly by distorting incentives. Under the current system, if the tax rate on business revenue is 20 percent, and the potential business owner expects to make a 10 percent return on his investment, he does not invest. Since there is no business to tax, no one benefits—this is known as a deadweight loss.

The advantage to the site value tax, proponents argue, is that it minimizes deadweight losses. They argue that since the site value of land is not dependent on the actions of the landowner, a high tax will

not remove the incentive of the landowner to develop the property. Land is fixed in supply, proponents of the tax point out.

If land has a value independent of the actions or improvements of the landowner, then nothing is lost by taxing it. The landowner expects to make a profit from improving the land. The site value is transferred to the community as tax revenue, which can be used to provide public goods.

So what's the problem with this line of reasoning? There is no such thing as "site value" in the first place. Using the terminology of Chicago economist Frank Knight, *all* production is simply the transformation of resources into products. The value of a given object is subjective and determined by people's willingness to pay; value is not inherent to any physical item.

### **If the taxes on site values are high, that could eliminate the incentive to search for natural resources.**

High site value taxes encourage one type of production (such as erecting tall buildings that have a lot of value per unit of land) and discourage another type of production (looking for natural resources, improving the quality of the land, building low density housing).

With this in mind, land is "produced" just as much as any other product, and a tax on "land value" is subject to the same critiques as the tax on any productive process.

Consider the search for natural resources. As with land, natural resources such as oil are limited in supply. But we do not know where all the oil is or the most efficient method of extraction. How do we incentivize the search for oil?

We assign a property right to the person who owns the land. They may sell the oil above the price of what it costs to extract that unit of oil, which some would point to as an

inefficiency. In reality, the profit is payment for production: for investing in search, for taking risk, for economizing on extraction costs. If land and natural resources are taxed at a high rate, where is the incentive to search?

This critique applies to all land taxes, but specifically we should recognize that the value of natural resources is *entirely* part of the site value. If the taxes on site values are very high, especially in comparison to other taxes, that could completely eliminate the incentive to search for natural resources or, more generally, bring the land to its highest valued use.

Economic theory does have some predictions about how land use will change in the presence of high land value taxes. Land will be put to use in low-risk ways that are easy to justify as physical improvements that take advantage of the comparably low tax rates on this activity.

Investment in technologies that will improve the productivity of the land without creating physical improvements will decline, since this would only drive up the land's site value. People would stop searching for natural resources, which would be taxed at very high rates, and instead invest in improvements that they believe will be exempt from taxes. Landowners could be indifferent, or even antagonistic, to improvements to neighboring land plots because those would only increase their own taxes.

At first glance, land value tax makes a lot of sense. Further consideration reveals it to be essentially naïve. In some limited cases, marginal reforms that shift tax from "improvements" to "land" might be efficiency enhancing. But there is nothing in economic theory that says that such a switch will increase revenue without increasing the tax burden or that it will provide a more equitable distribution of income.

## Current Use Tax and Liberty

If implemented effectively, this preferential tax policy may help landowners remain in possession of their land.

by **Steven Furnagiev, University of New Hampshire**

**W**ith the exception of Michigan, every state in the U.S. has some version of a current use tax. This preferential tax policy is designed to allow landowners to maintain tax rates based on the use of the land in its current state, be it for agricultural use or as open space.

Landowners from all states are likely familiar with a property tax code that assesses the value of their land, in part, according to the potential or future value of the land.

While there are economic arguments for allowing land to serve its most efficient purpose (in some cases development), this is often no consolation to individuals, landowners and non-landowners alike, who value non-pecuniary aspects of the agriculture or open space land in its existing state.

The current use assessment addresses such circumstances. It works by subsidizing landowners with the difference between the tax rate for land in its current use and the tax rate for any future appreciations on the land.

England and Mohr (2006) find that current use programs may postpone and influence development patterns. While land conversion generally proves to be the most profitable choice, landowners who enjoy non-pecuniary benefits of their property are more likely to delay development with the current use programs in place. The authors also note that these programs are generally well-received by the public.

Critics of current use tax programs lie on both sides of the conservation-development spectrum. Although current use taxes

are favored by some conservationists, others argue that they do not go far enough to prevent development of rural areas.

England and Mohr acknowledge that “for the land owner, the potential profit of development typically dwarfs the tax incentives favoring rural users.” In other words, current use tax programs may not offer sufficient incentive to prevent landowners from deciding to sell or develop land. As a result, a current use tax may be more likely to delay development rather than prevent it.

**A current use tax can be seen as a means of protecting property rights—though it does not always work perfectly.**

Those in favor of development say the costs of the program may be unjustified.

But the issue is not that current use tax programs are flawed conservationist policies. Rather, they are indirect means toward conservationist ends.

Within a constitutional context, a current use tax can be seen as a means of protecting property rights—though it does not always work perfectly. Property rights include the right to possess property, to exclude or prevent others from possessing it, to enjoy the property, and to dispose of it.

If implemented effectively, current use tax programs can benefit personal liberty and property rights in the U.S.

Property rights of landowners include the right to receive a fair price for their land and to willingly choose to engage, or not engage,

in the sale of their property. As a means of protecting property rights, current use tax programs may alleviate the financial pressure that makes it difficult for landowners to remain in possession of their land in its current state.

Effectively, the programs help owners maintain the right to develop or not develop land, at least insofar as securing a fair price from an interested developer. Under circumstances in which tax rates have exceeded the level at which a landowner would be able to maintain ownership of the land, the landowner may not be afforded due process in acquiring a fair price.

Current use tax programs are not without the potential to be exploited. For example, a developer could purchase land, hold it under a current use assignment, and develop it in the future at a minor early withdrawal fee.

A local government, as England and Mohr (2003) explain, has two policy tools through which to affect development through current use programs: a penalty for development and the property tax rate.

Fifteen states do not require a penalty for early withdrawal from current use programs. In seven states, landowners making an early withdrawal must pay a fine equal to a percentage of the market value of the land at that time.

The remaining 27 states with active current use programs charge a recapture fee. This fee would require a fine equal to several years' worth of prior tax savings before the time of withdrawal.



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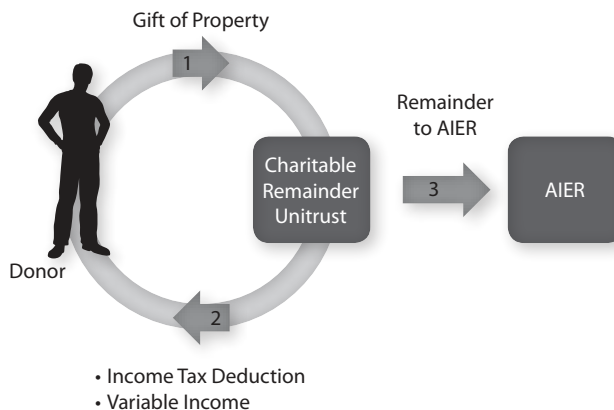


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