REALTOR® UNIVERSITY

Center for Real Estate Studies

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The *Journal of the Center for Real Estate Studies* is published three times annually by the Center for Real Estate Studies at REALTOR® University, 430 N. Michigan Avenue, Chicago, Illinois 60611. ISSN Pending. For information, please contact Peter C. Burley, CRE, FRICS, Director, Center for Real Estate Studies, REALTOR® University, at pburley@realtors.org, 312.329.8542.

From the President and the Chairman of the Board of Regents of REALTOR® University

We are pleased to welcome you, once again, to REALTOR® University and The Center for Real Estate Studies. We have built REALTOR® University from the ground as an institution of higher education, focused exclusively on the practice of real estate as a profession, to empower real estate professionals and to offer our students the most valuable advanced real estate education available.

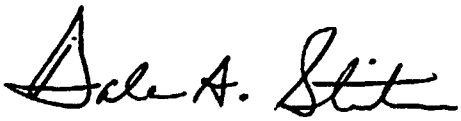
It is our belief that an exceptional University requires a current and relevant curriculum, practical and applied research and knowledge, outstanding faculty with real world experience, and an inspired community of students. Our board, panels, faculty and staff reflect that belief and include some of the brightest and most respected individuals in the industry.

The Center for Real Estate Studies continues to identify, fund, and produce high-level, impartial, and scholarly research on critical issues in real estate, conducted by recognized academic and industry leaders. The research and companion articles in the *Journal of the Center for Real Estate Studies* represent a small sample of the important industry issues we address at the Center on a regular basis.

Through our innovative research, our extensive community, and expanding areas of study, we are committed to facilitating lifelong learning opportunities for our students and for the real estate community at large.

This is an exciting time in real estate and we are committed to leading the REALTOR® community to the next level of professionalism and to advance the industry as a whole through the production of high-quality research and public policy recommendations that support broad social and societal goals.

Sincerely,



Dale A. Stinton, CAE, CMA, CPA, RCE
President, REALTOR® University

Richard J. Rosenthal, DSA, MSA, CRE, FRICS, CRB, GRI
Chairman, Board of Regents, REALTOR® University

A Note from the Director of the Center for Real Estate Studies

Welcome, once again, to the *Journal of the Center for Real Estate Studies*. We continue to hope that these pages will inform, entertain and offer food for thought on many of the issues in real estate today.

Response to our first edition of the *Journal* has been overwhelmingly positive. We trust that response is a reflection of success in our ongoing mission at the Center for Real Estate Studies to seek out and produce relevant, impartial, scholarly studies of practical use and importance to real estate professionals, businesses, policymakers and others. We strive to provide research and ideas that move beyond the theoretical and methodological to the practical and applied in order to inform the many constituencies in real estate on important issues now and in the future.

We begin this second issue of the *Journal* with center-sponsored research conducted by Selma Hepp, Ph.D., Senior Economist of the California Association of REALTORS®, and Casey Dawkins, Ph.D., of the National Center for Smart Growth (NCSG) at the University of Maryland, on an analysis of the effects of higher education on REALTOR® success. While the relationship between education and an individual's earnings has been explored widely in numerous professions and industries, and a positive relationship between education and earnings is apparent, Hepp and Dawkins focus specifically on the real estate profession to measure the impact of such variables as education on real estate agents' earnings. Using data on REALTOR® income from the 2010 Member Profile Survey produced by the NATIONAL ASSOCIATION OF REALTORS®, the author's model and measure whether, and to what extent, post-secondary education has on REALTOR® income. The analysis also evaluates the impact of holding an NAR certification and/or designation.

Our second center-sponsored research article for this issue comes from Thomas M. Springer, Ph.D., of Clemson University and Elaine Worzala, Ph.D., of the College Charleston. In this article, "Time-on-the-Market as an Indicator of Residential Real Estate Market Conditions," Springer and Worzala look at a single economic fundamental, employment growth, to examine its relationship with average time-on-the-market. They find that an inverse relationship between time-on-the-market and job growth holds true to expectations across most cities in either a "normal" or a "boom" economic scenario. In a recession scenario, however, they find that the relationship becomes unstable and counterintuitive. That is, in an economic downturn, the housing market does not respond as predictably as expected for a variety of reasons.

Our third article this issue is a submission from P. Barton DeLacy, MAI, CRE, FRICS, National Energy Practice Director in Valuation and Advisory Services for CBRE in Chicago. In his article, entitled, "Earth, Wind, and LULUs—Wind Farms, Harvesting Energy or Controversy?" DeLacy explores a number of issues surrounding the siting of utility scale wind farms. As wind farms are being situated ever closer to populated areas, they have met with growing resistance from nearby residents who fear drops in property value and potential adverse health effects. "As debate intensifies" DeLacy tells us, "so too builds the arsenal of studies cited by third party experts to quantify or deny claims of damages." In his article he discusses the emerging body of literature on both sides of the issue and attempts to evaluate the resources available for decision-makers and property interests alike.

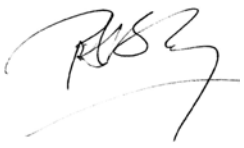
Mary Martinez-Garcia, Manager, Library & Digital Information Repository, Information Central at the NATIONAL ASSOCIATION OF REALTORS®, and also, REALTOR® University Librarian, takes "A Look Back at the Commercial Real Estate Landscape, Post-9/11." "With the rise of One World Trade Center, and the approaching 12-year anniversary of the September 11th terrorist attacks, one cannot help but be reminded of the collapse of the Twin Towers and what that single event symbolically meant," Martinez-Garcia writes. Noting the NAR response, she reminds us that the commercial real estate sector required a "more tactical" approach, as financing in the sector was in jeopardy and insurance covering terrorist threats was only held in place through Congressional action. Mary offers an enlightening timeline of commercial sector conditions in the years following 9/11 and of legislative activity related to commercial real estate, as well as a look at activities at NAR during the period.

We take a look at the real estate recovery in California, courtesy of the research team at the California Association of REALTORS® who, with Senior Economist, Selma Hepp, offer a glimpse into recent history and trends. "California's housing market has been through some remarkable times in recent history," Hepp reminds us, "Over the past decade, home prices rose to unprecedented levels and dropped just as quickly." After a slow and painful initial recovery, "California's housing market is on a solid road to recovery." Like much of the rest of the nation, however, "the return of the traditional buyers and sellers into the market is predicated on many housing policies currently debated in Washington. Resolution of the GSE reform, along with various other bills currently on the table, will have a critical impact on the ability of future generation to acquire homes and gain equity over time."

Finally, we leave you with our regular STATs Data Corner, where we offer a rundown of important industry statistics, updated with the latest releases available at the time of this printing.

We hope you enjoy this issue of the *Journal of the Center for Real Estate Studies*. We appreciate your input, participation, and article submissions. We hope you will consider supporting us in producing the *Journal*. Your support will help us continue to produce a *Journal* that informs, entertains and offers food for thought on many of the issues in real estate today.

Thanks again,



Peter C. Burley, CRE, FRICS
Director, Center for Real Estate Studies, REALTOR® University

SUMMARY

Earth, Wind and LULUs—Wind Farms, Harvesting Energy, and Controversy

No longer an exotic curiosity, the siting of utility scale wind farms ever closer to populated areas has met growing resistance. Chief among opponents are uncompensated proximate residents fearing drops in property value, if not adverse health effects. As debate intensifies, so too builds the arsenal of studies cited by third party experts to quantify or deny claims of damages. This article discusses the emerging body of literature on both sides of the issue, so that the real estate professional might better advise clients potentially affected by such intrusive developments.

The paper first reviews the state of the wind industry and briefly discusses the incentives and public policy driving development. It then explores the kinds of impacts alleged to occur when turbines are sited near residential settlement. Finally, the article reviews recent literature addressing value impacts, focusing on peer-reviewed articles and studies. The paper attempts to evaluate the resources available for decision-makers and property interests alike.

Earth, Wind and LULUs—Wind Farms, Harvesting Energy, and Controversy

P. Barton DeLacy, MAI, CRE, FRICS

Introduction

A 300-foot wind turbine, a latter day windmill, is an electrical power generating machine. The value of such a generator will depend on the sustainability of the power it produces, and the price paid for that power over time. So is the real estate the tower occupies of any consequence? Certainly location is key; the speed and duration of wind varies from place to place. However, a utility scale wind farm, with turbines distributed over thousands of acres, may take less than 5 percent of that land out of production. Farming or grazing may continue unaffected. Nevertheless, opponents, concerned with adverse impacts on property values are leveraging the local siting process to block or delay further development. A growing body of evidentiary studies are being touted by both sides. This article intends to explore the sufficiency of impact reporting and direct the reader to resources as the body of knowledge evolves.

Photo credit: Author

The Wind Industry Today

The metrics of the wind energy count the installed "nameplate" power capacity as the best measure of market penetration. This capacity is typically expressed in terms of multiple watts, a common unit of energy. Today, as of second quarter 2013, the U.S. has 60,000 Megawatts (60 Gigawatts) of installed wind power; from Alaska and Hawaii to Maine and south to Texas[1]. Of interest, there are virtually no significant wind installations east of Texas and south of Tennessee. The wind resource is simply not very good in the humid southeastern U.S.

For perspective, consider that the average wind turbine installed today is rated between 1.0 and 1.5 Megawatts. Hence, there are at least 50,000 wind turbines operating at that capacity today across the U.S. Yet, at best, wind accounts for less than 2.00 percent of all electrical power produced in the U.S. One could compare a large 250 MW wind farm (say 150+ turbines spread over 30,000 acres) with a small 500 MW coal-fired power plant. The power plant might be sited on as few as 10 acres, even including a cooling pond. While nameplate capacity suggests the coal plant could produce twice the electricity as the wind farm, in fact, the wind farm would produce much less. Wind blows intermittently and at inconsistent velocity. If the coal plant has fuel to burn, it can generate power 24/7.

In general, a wind energy power plant (referred to as "utility scale" and typically having sufficient turbines to produce 10 MW or more power) will generate its nameplate capacity 30 – 35 percent of the time. For coal that number is closer to 95 percent. Coal units must be taken off line, or curtailed, periodically for servicing. Natural gas "peaker" units, much more compact and efficient, can be brought online at the flick of a switch.

Environmental considerations aside, two economic facts can be said to drive energy policy in the United States: (1) We lead the world in consumption of energy and (2) we no longer are self-sufficient in meeting our needs. Consumption will only grow, while reliance on fossil fuels creates climate concerns and leaves the U.S. hostage to the vagaries of world oil markets.

This policy paradigm has been challenged by the unforeseen success with industrial gas drilling (hydraulic fracturing or "fracking"). Fracking promises to unlock natural gas and oil reserves contained in extensive subterranean shales underpinning much of the continent. Abundant shale gas could help the U.S. achieve energy independence, while under some scenarios undermine policies supporting subsidies to renewable energy interests.

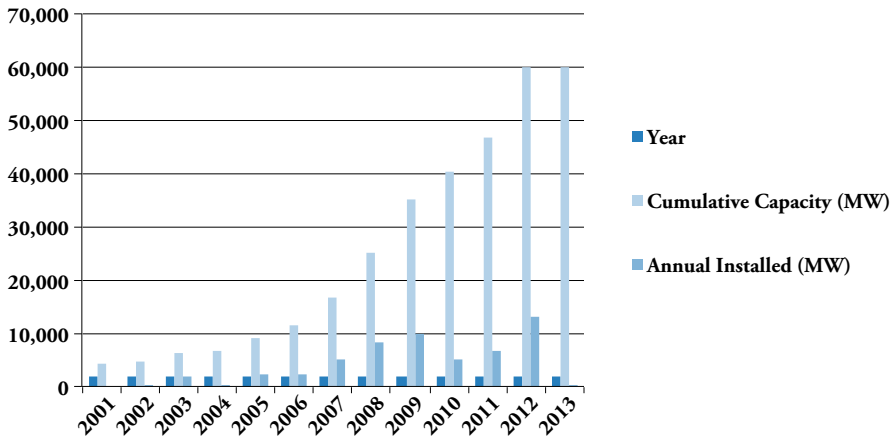
But for such enabling state and federal policies, most wind projects would not have been built. Figure 1 shows the steady increase in installed capacity driven by two critical incentives:

1. State by state Renewable Portfolio Standards (RPS) that compel regulated utilities to buy a percentage of their power from qualifying renewable sources (i.e., wind, solar, bio-fuel, etc.). The RPS assures a market for the power generated by the wind farm.

2. Production Tax Credits (PTCs)—federal incentive to compensate developers for up to a third of the capital development cost of wind or solar development.

[1] AWEA U.S. Wind Industry Second Quarter 2013 Market Report

Figure 1: U.S. Wind Power Capacity Growth



The chart above shows two things: in 2002 and 2004 the annual year-over-year installed capacity dropped; and secondly, virtually no capacity has been added in 2013. In all three years, the incentivizing tax credit expired. So, in 2012, the wind industry suffered a near death experience, when Congress only renewed the PTC program at the last minute and only for one year. Industry advocates have long lobbied for a permanent entitlement to better sustain the wind business and its domestic supply chain for components and parts.

The American Wind Energy Association (AWEA) explains that the late extension of the PTC and historic levels of installation during the fourth quarter of 2012, led to the anemic levels of production to date in 2013. However, AWEA reports that the pipeline of projects may be rebuilding; since January, over 3,950 MW of long-term power purchase agreements (PPAs) have been signed, and at least 22 RFPs for wind, renewables or other capacity have been issued. This means siting controversies may soon resume.

Why Real Estate Matters to Wind Development

The siting of proposed wind farms touches the real estate industry several ways: Land must be bought, leased or optioned; local zoning or permitting approval obtained; the basis for property tax assessment negotiated and local road and grid infrastructure upgraded or modified.

However, before all that, the location must be confirmed to have a suitable wind resource. Although the U.S. Department of Energy (the DOE) publishes wind maps showing general patterns, the adequacy of a particular site can only be confirmed after a year-long monitoring of wind strength with strategically situated meteorological towers (met towers). The long-term impacts of wind turbines on birds, livestock and surrounding property values remain unresolved, yet many jurisdictions will require Environmental Impact Studies to site a large scale project.

In some cases where habitat threat is known (presence of the Indiana bat, for instance), then tower placement will be adjusted to mitigate the intrusion. However, the whole arena of potential human impact from health to hearth remains open to debate, particularly in the permitting phase.

Although the author has worked around the country and monitored the industry for over a decade, the zoning law has yet to be written that allows "big" wind as an outright use. However proscribed, wind farm placement is most always vulnerable to public challenge and ad hoc approvals.

Siting Challenges in Rural Areas

To any who have driven along a seeming miles long placement of wind turbines, one can see that the building of such a project is no small undertaking. While most projects can actually be constructed during a single building season, the planning and permitting process may take years. As the industry has matured, so too have the arguments and studies purporting potential damages or denying such.

The siting of so-called LULUs (Locally Undesirable Land Uses) in rural areas often triggers public review. The potential impacts on local property values must be addressed as one of the criteria for project approval. Wind farms are treated no differently than landfills, or nuclear waste dumps, for that matter.

Not surprisingly, contention rises whenever wind farm proposals approach settled areas, as opposed to remote windblown deserts. The approval process varies across jurisdictions. In New York, individual townships have say, while Washington state devised a statewide siting council that could override county planning boards. In most places it is at the county level that planning boards or commissions are sufficiently staffed to evaluate contending claims.

In essence, wind developers look to build and move on to the next project, while leaving the local landscape dramatically changed. In the process of tying up land (given that a sufficient wind resource has been identified and project financing secured), the developer will attempt to broadly compensate as many landholders as possible, thereby removing opponents, if not currying outright goodwill.

Opposition begins with proximate land owners who are not otherwise compensated. They will allege adverse property value impacts and often health fears. This is the typical NIMBY (Not in My Back Yard) gambit familiar to any real estate developer who must obtain project approval through a public process. Motive is always suspect and standing to protest will vary with jurisdiction.

The Bones of Contention

Teams of dueling experts will be assembled by developers and opponents to marshal evidence alleging or refuting claims of potential damage. The fact is, the record is too short and the data too scant to effectively demonstrate effects either way. Nevertheless, the body of knowledge grows, perhaps elevating the erudition of the debate.

First, follow the money. Wind developers have evolved as a cottage industry because of the aforementioned financial incentives funded at both the federal and state levels. The incentives were created to promote environmentally responsible policies encouraging energy independence while lessening domestic dependence on fossil fuels. The financial incentives are necessary because the capital cost to build generators that use renewable fuels is significantly greater than building the equivalent that can burn coal, gas or oil.

These policies enjoy broad political support so long as someone else pays the bill, and the power generator is built somewhere else.

Wind developers thus offer clean, green energy and economic benefits. Their opposition at the community level includes aggrieved property owners and the occasional environmentalist concerned about bird kills and habitat impacts.

How long wind turbines will remain depends on technology, energy markets and consumer demand. The machines themselves are typically warranted for up to 25 years. Some first generation wind farms built west of Palm Springs in the 1980s have been decommissioned, but not removed. Turbines are most often sited on leased land where the underlying agreement usually calls for removal and restoration of the site at the end of a coterminous PPA. However ironclad such agreements today, there can be no assurance bankruptcy or some unforeseen economic restructuring could render such liability moot. How many superfund sites were created by no defunct companies, if not industries?

At a cost of $2 to $3 million apiece, installed, a utility scale wind farm can represent an investment in the hundreds of millions of dollars. Advocates will tout the economic

stimulus this might represent to a small community, yet well over half the cost is in the component parts, typically manufactured elsewhere. Local labor is seldom employed while the parade of tractor trailers conveying parts, one blade or nacelle at a time can be disruptive. The major long-term investment benefit of a wind project may be its contribution to the local tax base through property taxes.

Alternatively, developers will often negotiate a PILOT, or Payment in Lieu of Taxes. PILOTs can be lump sums or annual payments often targeting schools or infrastructure support. In some cases PILOTs will be phased out and property taxes substituted at later dates.

Finally, while wind farms are billed as powering so many homes, the implication being that the turbines outside your door are a significant local source of energy, the power generated is offloaded to the grid and dispatched on a regional basis.

Opponents to permitting wind farms allege stigma, loss in property values and adverse health effects. Interestingly, environmental opposition is stronger in nonfarming areas, perhaps because the industrial agriculture of the Midwest has already eliminated sensitive habitat. Adverse health impacts include reports of turbine noise, sleep disruption and shadow or flicker effects, supposedly caused when spinning turbines create a strobe effect when the sun is on the horizon. Health claims arising from indirect and somewhat remote influences are difficult to substantiate, however graphic or compelling. They are anecdotal at best. Funding for clinical studies is always limited and goes to the most egregious claims. No pattern of permanent debility from wind farm placement has yet emerged. But given enough time, who knows?

However, adverse property value impacts from LULUs (like wind farms) have long been subject to debate. The literature is rich with academic, industry and government sponsored studies addressing the perception, measure and duration of such impacts.

A Review of Resources Available to Gauge Impact

Real estate impact studies fall into two categories; micro-economic studies based on paired sales and hedonic studies based on statistical sampling and multiple regression. The former can be prepared by real estate appraisers using local multiple listings and assessor records. The latter analyses are much broader in scope and often require foundation or government funding to support.

Some peer-reviewed studies addressing "disamenities" (an academic term for LULUs) on rural home values have found modest impacts when high end or custom homes are involved (Kroll and Priestley, 1992). Other studies directly addressing wind farm impacts in the United Kingdom (Sims, et al., 2007, 2008), McLean County, Illinois (Hinman 2010), and Lewis County, New York (Heintzelman and Tuttle 2012) suggest negative impacts are too insignificant to measure. Other studies have suggested negative impacts dissipate over time and can be most significant in anticipation of construction, compared with post-construction transactions.

In most zoning cases, local appraisers are hired to demonstrate property value impacts of a proposed wind farm project. Appraisers will typically rely on a paired sales analysis, a technique commonly used to gauge price appreciation over time or measure how much to adjust for varying characteristics, like extra bathrooms or house size. In theory, one compares qualified arm's length sales of two identical properties, save for a single differentiating feature. The implication being that the difference accounts for the variance in price. The simplest example is the sale and resale of the same house. Absent changes to configuration or remodeling and assuming similar physical condition, any change in price over time might be attribute to appreciation (if the price went up) or depreciation (if the price dropped).

This approach is only as valid as the data allows. Paired sales have most relevance when the data set is homogeneous and there are lots of transactions, or "observations" in statistical parlance. Thus a large residential subdivision where homes are constructed by the same builder, where age and quality

is uniform, and only limited variables account for price differences would provide an ideal data set to search for paired sales. Paired sales might be analyzed to test whether adding a third garage increased property value. And if so, by how much, and did the value increase exceed the cost to add?

Paired sales would be an ideal and logical tool, if only houses were pencils. But every property is fixed in place and unique. Houses, even when seemingly identical, eventually come to reflect the style and habits of the occupant. No home is ever really an interchangeable commodity. Hence, the paired sale methodology, at best is an anecdotal tool that the appraiser relies on, not as absolute proof, but only as evidence supporting her findings, otherwise based on her judgment and years of experience.

And, as any appraiser will admit, sometimes the data does not cooperate. Two sets of paired sales, might show just the opposite. Data can be scrubbed, outliers explained, but in some cases, there is simply no accounting for personal preference. However, statistical theory recognizes this and deals with it two ways: increase the number of observations, or even better, randomly sample a vast population.

Going back to finding out whether wind farms affect property values, the analyst is now confronted with sparse settlement across a rural settlement where variability is high in terms of size, age, quality and utility of individual dwellings. Further, rural residences are seldom sited on uniform sized parcels akin to a lot on a block in a subdivision. The best solution is to significantly expand the scope of study.

Photo Credit: Author

To date, the most significant body of work studying wind farm impacts at a macro-level has been undertaken by the Ernest Orlando Lawrence Berkeley National Laboratory. The Berkeley Lab is based on the University of California campus. The Office of Energy Efficiency and Renewable Energy of the U.S. Department of Energy (the DOE) has sponsored ongoing research. As will now be discussed, this research has consistently found "no statistical evidence" that

home values near turbines were affected post-announcement or post-construction.[2] A team of analysts, led by Ben Hoen, have tracked home sale and resale data near wind farm projects since 2006. Their efforts are impressive and comprehensive, but have failed to satisfy critics. The issue is not that the Berkeley Lab's work is flawed, just that there are limits to what the available data can tell us.

The essence of Hoen's method was to blend on the ground observation with transactional records on a comprehensive scale. In 2006, Hoen had fewer than a dozen wind farms to study around the country. By 2012, he and his team were able to visit 67 different wind facilities and collect over 50,000 home sale transactions from 27 counties in 9 states.

The type of model the Berkeley Lab deployed is technically called "spatial hedonic analysis." While the detail and process are described at length in a pending white paper, cited below, the lay reader simply needs to grasp the concept. A hedonic model attempts to assign values to characteristics operating from the premise that choice can be inferred from price.

The model tests for the statistical significance of variable characteristics. Does the size of a house help explain its sale price for instance? One could plot sale price on the X axis and house size on the Y. If indeed a positive relationship does exist, that is, bigger houses tend to sell for more than smaller houses, the analyst might conclude that house size influences price. This is a simple linear example and its validity would depend on the quality of the data used. This example would be most compelling if all other factors were equal, i.e., location, age, quality, utility, etc.

The hedonic model involves multiple regressions. It allows testing for an array of different characteristics and has been extensively used to study housing markets for at least the past 30 years. It allows for the analyst to disentangle and control for competing influences on property value.

The Berkeley Lab model undertook to test whether home prices might be adversely affected when a wind turbine was located within one half mile. Depending on local topography, wind turbines can be plainly visible at 10 miles while large wind farms can be visible for up to 20 miles, particularly at night when Federal aviation rules require blinking red lights. Excessive wind turbine setbacks from structures or roads can impinge on project feasibility. A finding of adverse impact on houses close to turbines would make siting of wind farms in more populous rural areas that much more difficult.

Some of the averages help characterize Hoen's data set. Average sale price was $122,475, the average house sold was 1,600 sq. ft., 48 years old and sited on an average land parcel of just under one acre. While efforts were made to find property sales within one half mile of turbine placement, the actual average distance to turbines was almost five miles. These limitations are freely acknowledged by the authors, and doubtless, the impact issue will continued to be studied so long as the industry seeks wind farm placement closer to the populated loads they serve.

[2] Hoen, Ben et al., "A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States, Ernest Orlando Lawrence Berkeley National Laboratory, working paper, 2013

Conclusion

The wind energy industry has been nurtured, and arguably reached maturity, under a supportive regime incentivizing development of renewable energy resources in lieu of carbon-based fuel; i.e., coal, oil and gas. Today, this paradigm may be changing. The apparent abundance of natural gas undermines energy pricing, if not biased environmental policies. To be fair, no energy resource has developed without subsidy. However, the dramatic slowdown in wind development may augur premature obsolescence for these obtrusive machines. From a real estate perspective, uncertain economics may lead to blight and lost value. Agricultural land brokers may need to be as mindful of the price of kilowatt hours as bushels of corn.

Whether an impact can be gauged to be statistically significant is not the same as denying it exists. The problem is measurement. The best academic studies referenced here repeatedly find no measurable impact from wind farms on proximate home values. Yet, their data base is limited and perhaps inconclusive. Each transaction is inherently unique. Advocates on both sides will find evidence to support their interests and argument.

What shall policy makers, confronted with wind farm siting decisions, look to? Perceived economic benefits should be carefully balanced against long-term costs. Can tower removal be secured once the machines become obsolete? Since the power generated by "big wind" is offloaded to a regional grid, are assessment practices fair and sustainable to help support the local economy? Finally, if inverse condemnation is alleged, perhaps developers should simply acquire at market value affected properties, then resell them post construction. What better proof that impact is negligible then the resale at market prices of such homes?

P. Barton DeLacy, MAI, CRE, FRICS, based in Chicago, is National Energy Practice Director in Valuation and Advisory Services for CBRE. Mr. DeLacy's consulting experience includes wind farm property value impact studies, land lease analyses, and valuations of both renewable and thermal energy power plants. With numerous articles published in such journals as *The Appraisal Journal, Real Estate Issues* and *The Journal of the American Planning Association*, DeLacy holds a Masters in Urban Planning from Portland State University and a Bachelor of Arts degree from Willamette University.

References

Bell, Randall, Real Estate Damages, Applied Economics and Detrimental Conditions, 2nd Edition, The Appraisal Institute, Chicago, IL, 2008

Blomquist, Glenn, "The Effect of Electric Utility Power Plant Location on Area Property Value," Land Economics, Vol. 50, pp. 97–101 (1974)

Bond, Sandy. "The Effect of Distance to Cell Phone Towers on House Prices in Florida," *The Appraisal Journal*, (Fall 2007): 362–9

Bottemiller, Steven C. and Wolverton, Marvin L., "Further Analysis of Transmission Line Impact on Residential Property Values," *The Appraisal Journal*, The Appraisal Institute, (July 2003), pp. 244–252

Dale, Larry, Murdoch, James C., Thayer, Mark A. and Waddell, Paul A., "Do Property Values Rebound From Environmental Stigmas?" Land Economics, May 1999, Vol. 75, No. 2 pages 311–326

DeLacy, P. B., "Renewable Energy: Headwinds Ahead?" Real Estate Issues, The Counselors of Real Estate, Vol. 36, No. 3, 2011

DeLacy, P. B., "Wind Farms — A Valuation Primer," *The Appraisal Journal*, Appraisal Institute, Winter 2011

DeLacy, P. Barton, "A LULU of a case: Gauging Property Value Impacts in Rural Areas," *Real Estate Issues*, Fall 2004, Volume 29, No. 3.

Despite toxic history, residents return to Love Canal, CNN.com., August 7, 1998 **http://www.cnn.com/US/9808/07/love.canal/**

Ellis, Sherman R., "Effects of effluent from a coal-fired, electric-generating powerplant on local ground water near Hayden, Colorado," prepared for the U.S. Environmental Protection Agency, Doc# I 19.76: 81–1196, 1982

Gamble, H. B., Downing, R. H., "Effects of the Accident at Three Mile Island on Residential Property Values and Sales," Pennsylvania State University for Division of Safeguards, Fuel Cycle and Environmental Research, Office of Nuclear Regulatory Research, U. S. Nuclear Regulatory Commission, April 1981

Harris, John D., U. S. Environmental Protection Agency, "Property Values, Stigma and Superfund," Superfund Redevelopment Program, 1999; online at **http://www.epa.gov/superfund/programs/recycle/property.htm**

Heintzelman, M. D., and Tuttle, C., Values in the Wind: A Hedonic Analysis of Wind Power Facilities, Land Economics, 2012

Herzog, Steven J., Wind Energy: Power and Policy, *The Appraisal Journal*, The Appraisal Institute, January, 1999, pp. 24–29

Hinman, J. L., Wind Farm Proximity and Property Values: A Pooled Hedonic Regression Analysis of Property Values in Central Illinois. Master's Thesis, Illinois State University, 2010

Hoen, Ben, "Impacts of Windmill Visibility on Property Values in Madison County, New York," Bard Center for Environmental Policy, Bard College, Annandale on the Hudson, New York, 2006

Hoen, Ben et al., "A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States," Ernest Orlando Lawrence Berkeley National Laboratory, working paper, 2013

Jackson, Thomas O. and Jennifer Pitts, "Powerlines and Property Values Revisited," *The Appraisal Journal*, The Appraisal Institute, Fall 2007, pp. 323–30

Jackson, Thomas O., "Case Studies Analysis: Environmental Stigma and Monitored Natural Attenuation," *The Appraisal Journal*, 2004, Vol. 72, Number 2, 111–118

Jordal-Jorgensen, Jorgen. "Social Assessment of Wind Power: Visual Effect and Noise from Windmills — Quantifying and Valuation" AKF — Institute of Local Government Studies, Denmark, April 1996. **http://www.akf.dk/eng/wind0.htm**

Kroll, Cynthia A., and Priestley, Thomas. "The Effects of Overhead Transmission Lines on Property Values. A Review and Analysis of the Literature." Prepared for Edison Electric Institute Siting and Environmental Task Force. July 1992

Love Canal History; **http://www.globalserve.net/~spinc/atomcc/history.htm**

McCluskey, Jill J. and Gordon C. Rausser, 2001. "Estimation of Perceived Risk and Its Effect on Property Values," *Land Economics*, Vol. 77(2001): 42–55

McCluskey, Jill J. and Gordon C. Rausser, 2003. "Hazardous Waste Sites and Housing Appreciation Rates," *Journal of Environmental Economics and Management* 45(1): 166–176.

McCluskey, Jill J. and Gordon C. Rausser, 2003. "Stigmatized Asset Value: Is it Temporary or Long-term?" *The Review of Economics and Statistics* 85(2): 276–285.

McCluskey, Jill J., Ray G. Huffaker, and Gordon C. Rausser, 2002. "Neighborhood Effects and Compensation for Property Value Diminution," Law & Policy 24(1): 37–50.

Mundy, Bill, "The Impact of Hazardous Material on Property Value", *The Appraisal Journal*, The Appraisal Institute, Vol. 60, April 1992, 155–162

Royal Institution of Chartered Surveyors, "Impact of Wind Farms on the Value of Residential Property and Agricultural Land," An RICS Survey; November 2004

Schulz, Steven and Nick Schmitz, "Viewshed Analysis to Measure the Impact of Lake Views on Residential Properties," *The Appraisal Journal*, The Appraisal Institute, Summer 2008, pp. 224–32

Sterzinger, George, et al., "The Effect of Wind Development on Local Property Values," Renewable Energy Policy Project, Washington, D. C., 2003

Strathman, James G., DeLacy, P. Barton, Dueker, Kenneth J., "Creative Financing Concessions in Residential Sales: Effects and Implications," *Housing Finance Review*, Federal Home Loan Mortgage Corp., April 1984, pp. 149–163

Urban Environmental Research, LLC, "Clark County Property Value Report on the Effects of DOE's Proposal to Ship High Level Nuclear Waste to a Repository at Yucca Mountain," Scottsdale, AZ, December 2001

Wilson, Albert R., "Proximity Stigma: Testing the Hypothesis," *The Appraisal Journal*, The Appraisal Institute, Vol. 72, No. 3, Summer 2004, 253–261

Wilson, Shawn, "Evaluating the Potential Impact of a Proposed Landfill," *The Appraisal Journal*, The Appraisal Institute, Winter 2009, pp. 24–36

Wiser, Ryan, et al., "The Cost of Transmission for Wind Energy: A Review of Transmission Studies," Ernest Orlando Lawrence Berkeley National Laboratory, February 2009, **http://eetd.lbl.gov/EA/EMP**

Yergin, Daniel, "The Quest: Energy, Security and the Remaking of the Modern World," Penguin Press, 2011

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Thomas Priestley, Ph.D., CH2M Hill, (510) 587-7653; Analysis of the Visual Resources Impacts of the Revised KV Wind Power Project, internal technical memorandum prepared for Horizon Energy, November 7, 2005.

Arne Nielsen, Wind Engineers, Inc., Shadow Flicker Briefing re: KV Wind Power Project, November 23, 2005.

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Websites Researched

The British Wind Energy Association: **www.bwea.com**; BWEA Briefing Sheet — "Public Attitudes to Wind Energy in the UK," October 2005