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Wind Power and the Tax Base: Reliable as the Resource?

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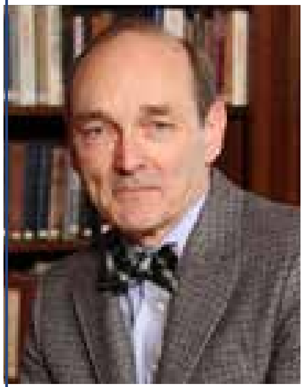


Abstract: *The efficient procurement and delivery of electric power must overcome an increasingly complex marketplace where public policy and economic reality frequently conflict. Into this environment, utility-scale wind farms have proliferated across the open American landscape. Yes, their fuel, the wind, is free; but not so their capital cost per Megawatt of power generated. Now, as the wind industry matures and incentives relied on to erect these machines evaporate, what is a wind farm's market value and are they being fairly assessed by rural taxing authorities?*

This paper explores the implications of how wind farms are project financed and poses two questions that bear directly on their ad valorem assessment.

1. *Given that, but for production or investment tax credits, most projects would not be built, do these credits accrue to market value, or are they a form of economic obsolescence?*
2. *The relative productivity of a wind turbine is a function of its nameplate capacity and a "Net Capacity Factor" measures its efficiency. Might the latter serve as a measure of functional obsolescence?*

These issues are now being raised in Lost Creek Wind LLC v. DeKalb County Assessor before the State Tax Commission and Circuit Court of Missouri.

Introduction

Today's high-tech 80-meter tall wind turbines owe their function and design to the iconic windmills of Holland. Only today's wind turbines harness wind to generate electricity, not grind grain. The economics of wind energy, as with any commodity, are a function of capital expenditure and cost of the resource. This paper first reviews the growth of the wind energy industry and considers its unsettled challenges in the years to come. We then discuss the market value of these projects in the context of ad valorem taxation.

In practical terms, wind turbines share characteristics of both real and personal property. The turbine tower, constructed of steel sections that are bolted together, is attached permanently to a reinforced concrete foundation that is poured, beginning ten feet below grade. The turbine blades are typically made of composite material and attached to a nacelle atop the 350-foot towers. The nacelle, the size of a boxcar, houses the generator and other necessary mechanical apparatus.

Wind farm developments are often funded through project financing. The anticipated revenue stream from sale of the power is used to pay off the debt. However, project financing seldom covers total installation costs. The difference, often up to a third of cost, must be made up by some of tax credit.

As an enterprise, the value of a particular wind farm is driven by the following considerations:

- Available investment incentives (to overcome the relative high capital construction costs)
- The quality of the wind resource in a particular location
- Proximity, availability and cost to connect to the local power transmission grid
- Revenues generated by the Power Purchase Agreement (PPA) to an off-loading entity.

Other variables, such as the efficiency of the turbine "machines" and the quantity of power generated are reflected in "net capacity factors" (NCF). Curtailment, the occurrence of downtime for repair or because of grid capacity constraints, may vary with location and with the age, design and performance of individual turbines. Hence, while we might develop a formula, or model to uniformly assess wind-generating facilities, the actual assessment of value must be made on a case-by-case basis, much like any other uniquely located parcel of real estate.

At issue here is the market value of the installed wind farm turbines and what should be the appropriate ad valorem assessment; given project costs, risks, potential revenue and public policy.

Wind farms are typically appraised as whole plant enterprises combining value contributions from all asset classes including real property, personal property and intangibles. Most assessing authorities are limited to taxing only tangible assets since intangible value is typically taxed in some other form as income.

The metrics of wind energy count the installed "nameplate" power capacity as the best measure of market penetration. This capacity is typically expressed in terms of multiple Megawatts, a common unit of energy. Today, as of late 2013, the U.S. has 60,000 Megawatts (60 Gigawatts) of installed wind power; from Alaska and Hawaii to Maine and south to Texas . 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 2.0 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% 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 with a cooling pond. While nameplate capacity suggests the coal plant could barely double the output of the wind farm, in fact, the wind farm would produce far less. Wind blows intermittently and at inconsistent velocity. If the coal –fired 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% of the time. For a coal fired power plant, that number is closer to 90%. Coal –fired units are only curtailed periodically for servicing.

The Advance of Wind: The Panacea for Renewable Energy?

Environmental considerations aside, two economic facts can be said to drive energy policy in the United States:

1. The US leads the world in consumption of energy and
2. We are still perceived as no longer being self-sufficient in meeting our needs.

It is assumed that energy 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 lately challenged by the unforeseen success with industrial gas drilling (hydraulic fracturing or "fracking").

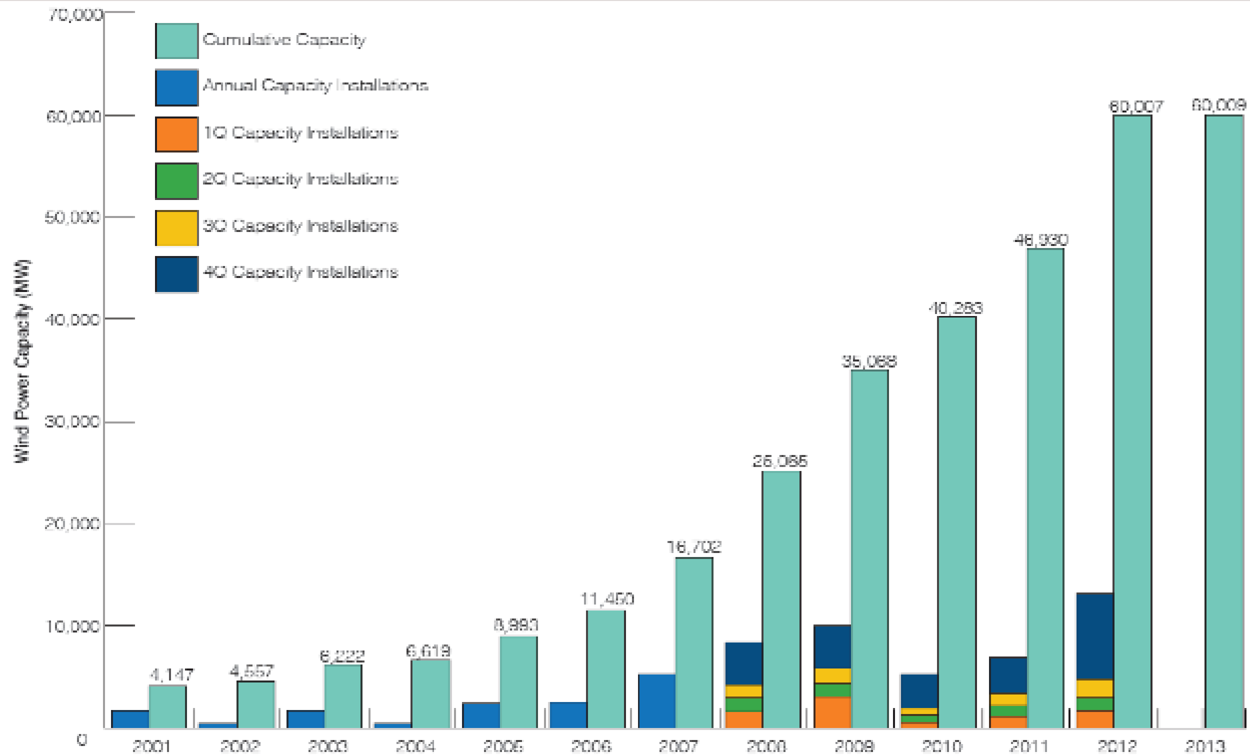
The issue of government subsidies for energy production is controversial. It can be argued all energy resource development has benefitted from some form of subsidy. From oil depletion allowances to Depression-era dam-building projects, the Federal government has helped fund the building of US energy infrastructure.

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

1. Production Tax Credits
2. State by state Renewables Portfolio Standards.

These incentives will be discussed further.

Fig. 1 Annual totals of accumulated wind capacity in US (AWEA 2013)



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 turbine installations to date in 2013.

However, the U.S. Department of Energy through its Energy Information Administration (EIA) estimates that U.S. wind capacity will increase by 8.8% in 2014 to about 66 gigawatts (GW) by the end of 2014. Capacity is forecast to increase a further 14.6% to total more than 75 GW at the end of 2015. Electricity generation from wind is projected to increase by 2.2% in 2014 and by 11.4% in 2015, contributing more than 5% of total U.S. electricity generation by the end of 2015. Given these projections, siting controversies and debate over appropriate taxation of these power plants are unlikely to abate any time soon.

The Context for the Ad Valorem Taxation of Big Wind

Although the first utility scale wind farms date to the 1970s in Southern California, the proliferation nationwide did not commence until the present century. As with other nascent industries responding to shifting public policies, "Big" wind looked to incentives as much as the resource. Often seen as an economic boon to sparsely populated rural counties, how the machines might be taxed evolved on an ad hoc basis. Wind farm development provides short-term construction jobs, sales and use taxes, but limited long term employment to its location. Thus local governments and school districts covet potential contributions to the property tax base

Wind farms had not been foreseen by most taxing jurisdictions. Just as many rural planning commissions legislated variances or exceptions to allow electric power generation in farm and pastureland, so too, taxing jurisdictions had to decide if a wind turbine was some type of farm implement or an industrial power plant.

Not surprisingly, state and local ad valorem assessment practices have yet to converge on any uniform treatment. An excellent resource detailing this variance is DSIRE, the Database of State Incentives for Renewable Energy (DSIRE) maintained by the EIA. DSIRE inventories the 41 states and Puerto Rico where renewable energy incentives have been put in place.

See http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=PA26F.

Across the 35 or states where utility-scale wind farms have been installed (defined as over 10 MW in size), ad valorem valuation practice ranges from complete exemption to conventional depreciated replacement cost. We must remember, wind farms have two unique characteristics:

1. The land they occupy is often leased, not owned outright. Lease terms may vary and include a fixed rate, a royalty-type percentage of output from the turbine, or a combination of the two income streams.
2. The wind turbine is properly characterized as a machine, bolted to its reinforced concrete base and thereby secured to the ground.

Some jurisdictions merely tax the increment in value created by the land lease where personal property is not assessed. Other jurisdictions have deferred the ad valorem issue by accepting PILOTs (payments in lieu of taxes). Seldom has the issue been dealt with legislatively. A brief overview of some state assessment practices demonstrates this variability.

- In Pennsylvania, for instance, non-realty assets are not subject to property taxes. A 2006 statute classifies towers, blades, nacelles and all transmission infrastructure as non-realty. Only the concrete base and road improvements are subject to replacement cost valuation. Leased land is valued using an income approach if comparable sales are not available.
- California, Washington and Oregon tax real and personal property and provide no special tax incentives for wind. Oregon and California, however, do incentivize distributed renewable energy, where power produced is consumed on site rather than merely uploaded to the grid.
- Colorado exempts facilities under 2.0 MW in nameplate capacity, but otherwise applies a template that factors in nameplate rating and the Net Capacity Factor (NCF) to calculate assessed values. Importantly, Colorado assessment rates are tied to the relative productivity of utility scale wind farms as power generators.
- Other states, such as New York, accepted so-called PILOTs from developers in exchange for go-forward exemptions limited to a period of years. Otherwise, New York had had a 15-year exemption for property taxes on renewable energy installations. Oklahoma has a five-year exemption period.
- In New York and Pennsylvania, modest income from turbine land leases offsets unrelated declines in small dairies, making small 200-300 acre landholdings marginally sustainable. Township and county assessing authorities in poor districts have been reluctant to discourage wind development by being too aggressive on taxes.

- Finally, some states, like Illinois reached a legislative solution. Prior to 2007, wind energy devices generating electricity for commercial sale were assessed differently depending on where they were located. Some counties valued the entire turbine structure (tower plus generation equipment) as "real property", subject to taxation, while others deemed only the tower portion as taxable property. This difference varied from county to county, creating dramatically different tax loads and complicating projects that crossed county lines.

  Today, the statutory "value "of a wind farm in Illinois is based on approximately $360,000 per MW, about one third the installed costs. A formula is then applied to that "market value" to calculate an actual assessed value.

The contribution of industrial utility-scale wind projects to local economies is mixed. Property tax receipts in Sherman County, Oregon, a remote wind swept jurisdiction of 1,800 people in the Columbia River Gorge have reaped tens of millions of dollars for local governments, a literal "windfall." Yet the balance between enrichment and the perceived degradation of scenic landscapes varies with population density and the proximity of wind farm to urban area.

Notwithstanding the variable socio-economic political environment of a particular state, professional valuers should still be ready to advise local assessors on best practices for valuing this complex improvement to the land.

Applicability of the Three Approaches to Valuing Big Wind

In this section, the applicability of each of the three approaches to value is discussed. In the end, most assessing authorities will likely rely on a cost approach. As with any purpose-built facility where it may be difficult to demonstrate a discrete property market, assessors will look at actual costs or defer to a cost service like Marshall Valuation.

A. The Income Approach

Most utility-scale wind developments are project financed. This means lenders tie debt repayment to the anticipated revenues to be generated by the Power Purchase Agreement (PPA). The financial model is essentially a discounted cash flow analysis where the revenue of the project has been predicated based on wind studies, the efficiencies of the installed turbines and the price paid for the power to be off-loaded to the grid. This is an enterprise model with no relation to the real estate except for the land lease; an incidental operating cost. Assessors will value the land separately, in part because another party typically owns it in fee.

The net cash flows are discounted to present value at a rate that reflects the minimal return required by utilities for capital investments, plus any surcharge for additional risk. This methodology cannot be used by assessing authorities because it encompasses multiple asset classes, thus functioning as a business enterprise valuation.

The PPA, which drives the value, is an intangible asset, typically ineligible for ad valorem taxation. While the PPA is modeled like a net lease, it is tied to electricity output and the price of that commodity. Not the same as passive rent earned when vacant space is occupied at market rents.

B. The Sales Comparison Approach

Wind farms do occasionally sell, but those transactions have also been at the enterprise level without clear allocations of value to the tangible asset classes involved. Hence, we find that the Cost Approach to value is the default indicator for taxing authorities. Further, as we shall show, obsolescence theory can be used to reflect some of the unique attributes of operating wind farms.

C. The Cost Approach

Whenever transactional market data is limited, assessing authorities typically look to a traditional Cost Approach to estimate ad valorem market value. In essence, the Cost Approach is comprised of two components; the market value of the land, as if vacant and the depreciated replacement cost of the improvements. This method is also appropriate for special use properties where use value can approach market value if the case can be made for a viable enterprise within a stable or growing industry.

We first start with replacement cost or actual costs if available. Replacement Cost is the estimated cost to construct as of the effective date of value, a substitute, using contemporary materials, standards, design and layout. Component costs can be volatile so the valuer should consider construction costs as of the valuation date. Costs may actually decline as the supply chain mobilizes to serve demand.

Actual construction costs are typically based on an EPC contract (engineering, procurement and construction) where the contractor designs the installation, procures necessary components and builds the project. The chart below shows how replacement cost might be evaluated on a per installed turbine basis.

Replacement Cost New

1.5 MW Turbine cost	$1,700,000	
Installation (per EPC contract)	$510,000	30.00%
Soft Costs	$102,000	6.00%
Total installed cost/turbine	**$2,312,000**	**/turbine**
Installed cost/MW	$1,541,333	/MW

These costs can then be applied to the entire project. We have assumed one hundred 1.50 MW turbines.

Project Nameplate Rating

A Number of Turbines	100.00	
B Nameplate Rating	1.50	MW
System Peak Rating (A x B)	150.00	MW

Total Project Cost

Total installed cost/turbine	$2,312,000	**/turbine**
Number of Turbines	100.00	
Total Project Cost	$231,200,000	

These costs include labor, materials, supervision, contractor's profit and overhead, architect's plans and specifications, sales taxes and insurance.

The overall cost per megawatt is a significant indicator here, because when compared with the costs to install alternate means of conventional thermal power, wind has typically had a higher installed cost per megawatt of nameplate capacity. When the Net Capacity Factor is included, the up-front cost differential becomes more dramatic.

Thus conventional combined natural gas-fired turbines can cost less than $1,000,000 per MW installed (compared to over $1.5 million per MW for a wind turbine in this example). Natural gas powered turbines have a much higher net capacity factor (NCF), meaning they can be efficiently operated close to 90% of the time, where even the best wind farms struggle to have an NCF over 40%.

However, even with the price of natural gas promising to stay low, wind is free.

The EIA has published a comparison of Total System Levelized Costs that calculates overall costs on a per kilowatt-hour (kWh) basis over an expected 30 year financial cycle and "duty" life of a power plant. This model surcharges coal for creating greenhouse gas externalities and takes into account the relative low fuel costs for wind and solar power.

Levelized Cost Projections 2018*

Plant Type	*NCF*	*Levelized Cost/kWh*
Conventional Coal	85.00%	$100.10
Natural Gas		
NG Combined Cycle	87.00%	$67.10
NG Conv. Combustion	30.00%	$130.30
Geothermal	92.00%	$89.60
Biomass	83.00%	$111.00
Wind	34.00%	$86.60
Solar PV	25.00%	$144.30

*DOE EIA Projections w/o tax credits or incentives, assumes 30 yr. life

These costs are projected five years out and will vary regionally. They emphasize the relative economy of wind over time and may not account for sustained low natural gas pricing.

The fact remains that, as of 2014, capital costs for wind development in the U.S exceed the present value of the revenue wind farms, at an acceptable rate of return. Thus, wind development remains dependent on tax credits and/or other incentives to help overcome wind's relative high capital costs. This leads to discussion on what forms of obsolescence, both functional and economic, should properly be applied in a cost approach for ad valorem assessments.

Application of Depreciation Concepts

The key to appealing or modifying assessor cost estimates of wind farms is the careful application of accepted depreciation concepts. Application of a conventional Cost Approach contemplates application of the three types of accrued depreciation:

1. Physical deterioration
2. Economic obsolescence
3. Functional obsolescence

Assuming the absence of any incurable defect, most assessors acknowledge a traditional straight-line age-life method for simple physical depreciation. Alternatively, they rely on a cost service or other conventions.

In the most common variation of the age-life method the cost to cure certain curable items (physical and functional) is known and can be deducted before the age-life ratio is applied; a process that mirrors what typical purchasers consider as part of the investment decision. Once processed, incurable items (physical and functional) can be estimated via the age-life ratio.

In the case of the wind turbines, the appraiser may simply divide their actual age into a twenty to twenty five year life. Most wind farms have been installed within the past decade and the industry lacks data substantiating a longer economic or physical life at this time.

The application of economic and functional obsolescence to the high replacement costs helps bring wind farm assessments into line with other means of conventional power generation. As noted above, installation costs for wind, based on the electric power it produces, are significantly higher than gas-fired alternatives.

The Case for External Obsolescence

External obsolescence is the adverse effect on value resulting from influences outside the property. External obsolescence may be the result of lagging rental rates, high inflation, excessive construction costs, restricted access, the lack of an adequate labor force, changing land use patterns and market conditions, or proximity to an objectionable use or condition. Here, we find the necessity of a significant tax credit to make a wind farm a viable investment constitutes an externality qualifying as economic obsolescence.

This means the high capital costs to develop wind power capacity can cancel out the benefits to investors, save for financial incentives like Production or Investment Tax Credits. The American Wind Energy Association (AWEA) and the U.S. Department of Energy (DOE) have shown that wind farm development falls off dramatically as these credits expire. In our cost model we show that the need for up-front capital incentives should be treated as economic obsolescence. The present value of such tax credits can amount to 30-35% of total project cost.

It can be argued that but for the Production Tax Credits, or PTCs, most U.S. wind projects would not get built. In fact, as AWEA predicted, wind farm development has once again stalled, as it has in the past, because of continued uncertainty over PTC incentives. They were extended through 2013, but are once again in limbo. Hence, we find this necessary supplement a form of inverse economic obsolescence. If the PTC goes away, many planned wind farms will stay on the drawing board pending some other form of subsidy or change in the economics of electric power generation.

An analogous situation is the treatment of Low-Income Housing Tax Credits (LIHTC), a federal subsidy also referred to as Section 42 credits, referencing the applicable section in the Internal Revenue Code. Many (though not all) taxing jurisdictions exempt or deduct tax credits from ad valorem assessments.

The tax credits, created under the Tax Reform Act of 1986, were intended to incentivize private investment in affordable housing. Typically the all-in cost to deliver qualifying units exceeds any capitalized market value based on net income after allowing for restricted rents. The owner's value thus falls well below costs to build. While selling tax credits to qualifying investors can make up the difference in construction cost, those benefits cannot be passed on to the next buyer. Thus, the argument goes, ad valorem property taxes should be based on an income approach. The amount of the tax credit subsidy would be deducted from any replacement cost estimate to reconcile with the lower net value projected by the income approach (without the subsidies).

In the case of a utility-scale wind farm we would deduct the outright subsidies offered by the production tax credit as a type of economic obsolescence peculiar to the incentives provided to developers to build renewable energy generation.

Functional Obsolescence

According to the Appraisal Institute, functional obsolescence can be caused by changes in market conditions that have made some aspect of a structure, material or design obsolete by current market standards. Functional obsolescence may also be curable or incurable.

To be curable, the cost to correct the deficiency must be equal to or less than the anticipated increase in value. We discussed the Net Capacity Factor, or NCF, as a relative measure of wind farm efficiency. It is a particularly useful metric to compare the efficiency of one type of power generator with another. Since the price of the power derived from wind farm operations is predicated on the cost of alternate fossil fuels, then the cost to use alternative fuels must be balanced against the relative efficiency of its generation. Hence, the inverse of the NCF is considered a reliable method to gauge functional obsolescence, as we will calculate in our model.

As mentioned above, we have also found that individual wind projects can be distinguished from one another by their relative efficiency as measured by their Net Capacity Factor (NCF). Essentially, an NCF calculates what percentage of the time a wind farm project is actually generating electricity or how much the wind blows combined with the mechanical proficiency of the model of wind turbine actually installed. The NCF of a coal-fired power plant might be close to 90% because it may be used in continuous operation and can be turned on or off at will. The NCF of a solar farm can be as low as 10-12% of its nameplate capacity because of cloud cover, night darkness, etc.

Hence, the NCF can be used as a measure of functional obsolescence for wind farms, where the Net Capacity Factor can vary from 25-40% of nameplate capacity based on the wind resource and also the performance of a particular model of turbine. It should be noted that the NCF for wind farms using larger more advanced turbines is approaching 50%. This suggests this measure of utility can be improved with technology.

Calculation of Values

On the table below we have calculated a market value for ad valorem assessment purposes based on the following assumptions:

1. Replacement Cost New (RCN) based on turbine and wind farm specifications discussed above.
2. We have assumed that the net present value of Production Tax Credits and other incentives would account for 30% of total costs to install the hypothetical 100-turbine wind farm on leased land.
3. Given a leased land scenario, land value or land assessments are not included.
4. The RCN is first adjusted for Economic Obsolescence: with wind farms this is quantified by tax credit incentives that can average up to 30% of project costs.
5. Net RCN adjusted for tax credits then must be charged for physical depreciation, here we project 4%/ year based on an expected 25 year economic life. In this example, the plant is assumed to be two years old.
6. A Net Capacity Factor of 35% would mean the plant produces its nameplate output only 35% of the time, thus it is the inverse, or 65% impaired by the intermittency of the wind.

Project Nameplate Rating

A	Number of Turbines	100.000	
B	Nameplate Rating	1.50	MW
	System Peak Rating (AxB)	150.00	MW

Total Project Cost

C	Total installed cost/turbine	$2,312,000	/turbine
D	Number of Turbines	100.000	
E	Total Project Cost (CxD)	$231,200,000	

Depreciation and Obsolescence Factors

F	Age	2	years
H	Tax Credits as % of RCN	30.00%	
G	Net Capacity Factor (NCF)	35.00%	

Application of Age and Obsolescence Factors

J	Total Replacement Cost New (RCN)	$231,200,000	
K	Economic-less TC incentives (GxJ)	-$69,360,000	
L	Net RCN less econ.obs. (J+M)	$161,840,000	
M	Physical (straight-line/yr.)	-$6,473,600	4.00%
N	Accrued Phys. Dep. (FxM)	-$12,947,200	
O	RCN less Phys. Dep. (L+N)	$148,892,800	
P	Functional Utility (1-H)	65.00%	
Q	Adj. for Functional Obs. (OxP)	-$96,780,320	
R	MC based on Cost Approach (OxQ)	$52,112,480	
S	MV/turbine (R/D)	$521,125	
	MV/MW (S/B)	$347,417	

The resulting market value for assessment purposes is $52,112,480 in this example. That is equivalent to approximately $521,000 per turbine or $347,000 per Megawatt of nameplate capacity. This value should be compared, on a net capacity basis, with assessed values for alternate means of generating electric power.

Based on these assumptions, not atypical for a utility-scale wind power plant of this size, we have reduced the nominal replacement cost value by over 75%. Absent market sales of wind power plants to challenge theory, the appraiser must apply her best curbside judgment and ponder, "Is this reasonable?"

Perspective: Wind Farms as Power Plants

Wind farms are fundamentally electrical power generating plants. Their fuel is wind. The wind performs the same function that pressurized steam does in a compact gas-fired thermal plant or falling water does in a hydroelectric dam. In each case the kinetic energy of turning rotors in a turbine spin magnets generating electricity. Thus it can be argued, for perspective, the valuer should look to relative costs or the occasional sale of a power plant in use to test the reasonableness of these adjustments.

The critical cost value drivers here here are the tax credit incentive and the net capacity factor. Both can vary with the wind project. The tax credit provides a subsidy when the negotiated Power Purchase Agreement (PPA) does not provide sufficient income over time to yield an adequate return to the investor. The PPA is typically a 20-25 year contract negotiated with the offloading utility and is based, in part, on avoided costs of electric power generated conventionally. When natural gas or coal prices are high, then the PPA will be higher and wind more competitive.

At the same time, wind farms of identical specification will perform dramatically differently depending on the long-term consistency of the local wind resource. Thus, in some locations the NCF approaches 50%. Offshore wind can raise the efficiency further. However, when incentives are increased, wind can be built where the NCF is below 30%. Finally, the turbine itself can be made more efficient by increasing its height.

The wind industry and public policies pursuing renewable energy solutions are still young. The market, electric power infrastructure and even the consumer, have yet to adjust to an evolving phenomenon. This article has attempted to raise issues for further study and, inevitably, debate.

DeLacy Consulting, LLC (DeLacy) is a Chicago-based boutique real estate advisory firm specializing in valuation consulting, appraisal services and litigation support.

P. Barton DeLacy, ASA, MAI, CRE, FRICS brings 35 years of valuation advisory experience, unmatched in its breadth across North American geographies and touching virtually all property types. In his recently concluded corporate career, DeLacy had concentrated on working with corporate clients and public institutions. He previously worked at Cushman & Wakefield, CBRE and Arthur Andersen.

Focusing on the real estate implications of power generation, Mr. DeLacy has built valuation models and studied property value impacts for geo-thermal, solar, wind and coal-fired power generation. He has also developed adaptive re-use studies for obsolete thermal plants. Published in The Appraisal Journal, Real Estate Issues and The Journal of the Center for Real Estate Studies, he has prepared testimony for Federal and state energy siting councils. He is qualified to testify as an expert witness at both federal and state levels.