TAXING WIND ENERGY IN MINNESOTA

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INTRODUCTION

In 1991, to spur the development of a wind-energy industry in Minnesota the state legislature exempted wind-energy equipment from property taxes.[1] In 1994 the Minnesota legislature enacted a wind mandate, ordering Northern States Power Company (NSP) to build or purchase a minimum of 425 megawatts (MW) of wind electricity by 2002. That law created a guaranteed market for about $400 million in wind-related investment.

The new wind mandate undermines the original justification for the wind-energy property tax exemption. Both the wind industry and local government officials agree that wind-energy facilities should now pay property taxes. But no agreement exists regarding the method and level of taxation. This paper addresses that issue, explores various tax-strategy options and offers guidance for state policymakers.

A fair tax policy for wind energy must balance four interests: the ratepayer interest in paying the lowest possible price for electricity; the wind industry interest in maximizing profits and accelerating wind-energy development; the interest of the community in which the wind facilities will locate in maximizing local tax revenues; and the interest of Minnesota in maximizing wind-energy development inside the state.

Wind energy can be a boon to Minnesota's remote rural counties. The two counties with the highest wind speeds, Lincoln and Pipestone, will be the earliest beneficiaries of this kind of development. All five counties in that corner of Minnesota boast wind speeds sufficient to promote significant wind developments. As wind-energy technologies advance and electricity can be competitively generated at lower wind speeds, more than a dozen other counties will become prime development sites.

Some county may benefit economically by becoming home to a major wind-turbine assembly or manufacturing plant. For most counties the greatest economic benefit will come in the form of wind developers' lease payments to landowners and tax payments to local governments.

A 425-MW wind "farm" will benefit the 150 or so landowners who lease parts of their land to wind developers.[2] Landowners could collectively receive from a few hundred thousand dollars a year to as much as $3.5 million a year when 425 MW of wind power becomes operational, depending on the type of contract they negotiate.[3]

Current Minnesota electric utility property tax policy channels virtually all of the revenues generated from taxing power plants to the benefit of the host community.[4] The current state utility property tax

rate is 4.6 percent.[5] At that tax rate, a 200 MW wind facility would generate an additional tax capacity for Lincoln County of $6.7 million(see Table 1). That would constitute about two-thirds of the total tax capacity of the County after the wind facility was in place. The annual benefit to the County residents would be $3.23 million. This benefit could be taken either as improved services by county governments or reduced taxes on businesses and households or some combination of both. At 425 MW the annual tax benefits to the County residents would rise to almost $4 million.[6]

Thus property taxes from wind-energy facilities likely would offer larger financial benefits than lease payments to landowners and the property tax benefits would be shared by a larger number of local residents.

This report begins by describing the way local property taxes are determined in Minnesota and how that affects wind-energy taxation. The second section examines the impact on local communities and on wind development of various tax-strategy options. The third section analyzes the impact that wind-energy taxes would have on the competitiveness of wind energy versus conventional electric generation technologies and on the competitiveness of Minnesota based wind-electric facilities compared to those in neighboring states.

The final section of this report offers our conclusions and contains specific guidance for Minnesota policymakers. Readers looking for a synthesis of the data contained in this paper can move directly to Section IV.

In designing a fair wind-energy tax policy it may be useful to work backwards. The first step is to determine what level of taxation would provide a significant and enduring financial benefit to the host community while not hindering the rapid expansion of wind-energy facilities. This report concludes that a wind energy tax of .25-.30 cents per kWh would not hinder the development of the wind industry in Minnesota and would provide substantial benefits to the rural communities that host these wind farms. Such a tax also would be in the range of existing utility taxes on power plants.

The second step is to design a specific method of taxation that achieves this level of tax. There are three general taxing strategies. One varies the existing utility class tax rate on wind-energy equipment and structures. We examine the impact on the community and on wind-energy developers of lowering the utility tax rate to 1 percent. A second tax strategy maintains the existing 4.6 percent utility class tax rate and varies the proportion of the wind-energy facility subject to the tax. We examine the impact of taxing only the foundation of the wind tower in the early years and then taxing only the foundation and the tower while excluding the other wind-energy equipment. A third tax strategy imposes a flat payment or royalty on every kWh generated. We examine the impacts of a .30 cent per kWh flat payment.

The first two options, varying the tax rate and varying the parts of the wind-energy facility to be taxed, are variations on the existing utility tax system and therefore will be more familiar to policymakers. However, these types of utility taxes may suffer from drawbacks that would not occur in a flat tax/royalty arrangement. Section IV explores the pros and cons of these three tax strategies.

The estimates used in this report are based on actual data from Lincoln County. We caution the reader that these represent only rough estimates and urge others to refine the numbers and explore still other tax strategies.

SECTION I:
HOW LOCAL PROPERTY TAXES ARE DETERMINED IN MINNESOTA

To design a fair tax on windpower we must first understand how taxes are determined. In the case of windpower, the present property tax system is structured in a way that results in a variation of the tax per kWh depending on the size of the wind-energy development.

How much each property owner pays is based on four factors:

- the level of local government spending
- the market value of local property
- the class tax rate for that type of property
- the local tax rate or tax multiplier[7] for that area

The first step in determining the amount of tax an individual property owner will pay is for each local taxing district— county government, township, school district, watershed district—to develop its level of spending(i.e., its budget). The Lincoln County government budget constitutes about half of the total budget of all taxing districts within the County.[8]

Having established how much the county's taxing districts will spend, the next step is to determine the taxing district's "tax capacity". This is the revenue-generating capacity based on existing tax rates. It is calculated by multiplying the market value of all taxable property—utility, industrial, railroad, commercial, residential, agricultural—by that property's class tax rate.[9]

Thus, for example, Lincoln County has estimated the market value of its residential property to be $46 million.[10] Multiplied by a typical state class tax rate for residential property[11], this results in a total residential tax capacity of nearly $715,000. If the next 100-MW phase of wind development were taxed at the current utility rate of 4.6 percent, it would add a tax capacity of $3.3 million, or 4.5 times the residential tax capacity.[12]

If the budgets of the taxing districts require greater tax revenues, the districts, in effect, will raise the tax rates. If the budgets are lower than the overall tax revenue generated by existing tax rates, they would, in effect, lower tax rates. But because class tax rates are set at the state level, the taxing districts use a tax multiplier that has the same result. The tax multiplier is determined by comparing the locality's proposed spending by the total tax revenue the area would generate if existing properties were taxed at their class tax rate. If the budget is higher than the tax capacity then properties will be taxed at a rate higher than the class tax rate. The tax multiplier will be greater than unity (or more than 100 percent).

In 1993 Lincoln County's average local tax rate or tax multiplier was 137 percent.[13] Average countywide tax rates in Minnesota vary from a low of 82.7 percent in Sherburne County to a high of 170.2 percent in Mille Lacs County. The statewide average is 128.7 percent.[14]

Property taxes are determined by multiplying the value of a property by that property's class tax rate and then by the sum of the local tax rates or tax multipliers. Thus if a commercial property is valued at $100,000 and the class tax rate for commercial property is 4.6 percent the tax capacity of that property

would be $4600. If the taxing districts' overall local tax rate or tax multiplier is 137 percent, the actual property taxes due would be 1.37 x $4600 or $6302.

The relationship between public spending, tax capacity, and the local tax rate or tax multiplier has important implications for wind power. New taxable development increases a county's tax capacity. That increased capacity can be used to increase spending without increasing taxes. Or it can be used to reduce taxes on existing businesses and homeowners.

Different kinds of development affect government budgets differently. Residential development increases the amount of taxable property but also tends to increase the demand for services such as fire and police and schools. The amount of revenue the county can generate without raising tax rates goes up but the budget also goes up. In some cases increases in spending may outrun the increase in tax capacity and taxes on existing properties could rise.

Power-plant development, on the other hand substantially increases the amount of taxable property without significantly increasing the demand for services. Thus a new utility plant allows the government the attractive option of either decreasing taxes or improving services or some combination of the two.[15]

Table 1 shows the estimated impacts on Lincoln County of wind farms of 100, 200 and 425 MW.[16] As we can see, a 100-MW wind farm taxed at the utility class tax rate of 4.6 percent would create about $3.36 million in additional tax capacity. That can be compared to the current County-wide[17] tax capacity of $3.64 million. In other words, a 100-MW wind farm would virtually double the tax capacity of the County. If the County budget did not increase, taxes on existing businesses, farms and households could be cut in half.

In most of our calculations we provide estimates based on both a zero and a 10-percent increase in the County-wide budget. The increase in expenses directly attributable to wind development would probably be quite small.[18] In other words, wind-energy development, as with conventional power plant development, generates a large net benefit to the County.

The adjusted tax data in Table 1 represent the tax benefits generated by wind-energy at various levels of wind-energy development. Thus, assuming no budget increase, at 100 MW a wind farm taxed at 4.6 percent generates $2.39 million in taxes. The budget of all governments in Lincoln County combined is $4.98 million. Thus the existing businesses, farms and households in that County would see their overall tax payments drop from $4.98 million to $1.59 million. At 200 MW of development, the wind farm generates $3.23 million in taxes, reducing the payments by existing local taxpayers by more than 65 percent. On the other hand the tax per kWh of wind electricity would be a very high 1.2 cents.

If the County were to increase its budget by 20 percent, the reduction in taxes would be 38 percent. If it were to increase its budget by 50 percent, the reduction in taxes would be 22 percent.

As the amount of wind electricity generated within a County increases, the contribution of the wind facilities to the County's overall tax capacity increases. A 425-MW wind facility, taxed at 4.6 percent, would constitute some 80 percent of the County's entire tax capacity. Assuming a 10-percent budget increase, there would be a 78 percent reduction in taxes paid by property owners. The tax per kWh would fall to .49 cents.[19]

Table 1: Impacts on Lincoln County of Taxing Wind-Energy Equipment at Class Tax Rate of 4.6 Percent

	100 MW	200 MW	425 MW
Lincoln County-wide Average Tax Multiplier	137%	137%	137%
Lincoln County-wide Tax Capacity(1994)	$3,641,315	$3,641,315	$3,641,315
Lincoln County-wide Budget (est.)	$4,988,602	$4,988,602	$4,988,602
Estimated Market Value of Wind Turbine	$250,000	$250,000	$250,000
Number of Turbines (73 turbines per 25 MW)	292	584	1,241
Total Value of Turbines	$73,000,000	$146,000,000	$310,250,000
Class Tax Rate	4.6%	4.6%	4.6%
Additional Tax Capacity of Wind	$3,358,000	$6,716,000	$14,271,500
Total kWhs per year	208,050,000	416,100,000	884,212,500
Adjusted Tax Multiplier- same budget	71.3%	48.2%	27.9%
Adjusted Tax Multiplier- 10% increase in budget	78.4%	53.0%	30.6%
Adjusted Tax Multiplier- 20% increase in budget	85.5%	57.8%	33.4%
Adjusted Tax Multiplier- 50% increase in budget	106.9%	72.3%	41.8%
Adjusted Tax- same budget	$2,393,338	$3,234,762	$3,974,519
Adjusted Tax(cents/kWh)- same budget	1.15	0.78	0.45
Adjusted Tax- 10% increase in budget	$2,632,671	$3,558,238	$4,371,971
Adjusted Tax(cents/kWh)- 10% increase in budget	1.27	0.86	0.49
Adjusted Tax- 20% increase in budget	$2,872,005	$3,881,714	$4,769,423
Adjusted Tax(cents/kWh)- 20% increase in budget	1.38	0.93	0.54
Adjusted Tax- 50% increase in budget	$3,590,006	$4,852,143	$5,961,779
Adjusted Tax(cents/kWh)- 50% increase in budget	1.73	1.17	0.67

SECTION II:
STRATEGIES FOR TAXING WIND ELECTRIC SYSTEMS

Here we discuss five tax-strategy options for wind electric systems. These constitute the major tax strategies that are currently being used in Minnesota or elsewhere, or which have been proposed by interested parties.

A. Tax Wind Electricity at Existing Utility Rates

Traditional electrical generating facilities pay taxes on equipment as well as buildings and land. Local county assessors put value on the land and buildings. The Department of Revenue sets the value on the equipment, referred to as "attached machinery".[20] The current utility class tax rate is 4.6 percent.

Table 2 provides the data needed to analyze the impact of this tax strategy. As we can see, the impact depends on the size of the wind facilities, the level of government spending, and the level of depreciation taken. Depreciation can be an important issue. The faster a power plant owner can depreciate or reduce the market value of the power plant for tax purposes, the lower is the tax benefit to the county.

Under the existing system, the Minnesota Department of Revenue allows utility property to be depreciated according to a schedule developed by the Federal Energy Regulatory Commission (FERC). For most power plants this results in a depreciation for property-tax purposes of 3 percent per year. After the first 20 percent depreciation is taken, Minnesota allows a utility to further depreciate the plant by one half of any additional depreciation. For example, in year one depreciation would be 3 percent. In year two it would be 6 percent and in year three 9 percent and so forth. In year seven the depreciation would be over 20 percent. From that time on, the plant would be depreciated by a rate of one half of 3 percent per year or one half of the actual depreciation that occurs. Therefore in year 10 the power plant would ordinarily be considered depreciated by 30 percent or ten times 3 percent. But for property tax valuation purposes, the depreciation allowed would be 20 percent plus one half of the additional depreciation of 10 percent for a total of 25 percent. A 25 percent depreciation means that the power plant would be taxed based on 75 percent of its original value.

The state does not have a separate depreciation schedule for valuing wind equipment. Insufficient data on the resale value of wind equipment currently exists to develop such a schedule. It seems reasonable to expect that wind equipment would depreciate in value more rapidly than conventional power plants, if only because new, higher-efficiency wind turbines will enter the market, driving down the value of existing wind equipment. It may be instructive to note that Alameda County, California, home to more than 700 MW of wind capacity, among them some of the nation's first large wind turbines, taxes wind energy on a depreciation schedule that by year 10 values the wind equipment at only 5 percent of its original value.[21]

Table 2 shows the impact of applying the 4.6 percent utility tax under various scenarios.[22] Reading from the table, in year one wind equipment would depreciate by 3 percent in value, using the conventional power-plant depreciation as the guide. A 100-MW wind farm in the first year would reduce the Lincoln County local tax rate or tax multiplier from 137 percent to 79 percent a 46 percent reduction, assuming a 10 percent increase in the budget. The tax per kWh generated would be 1.25 cents.

The table also reveals the impact of the continuing depreciation of utility equipment. In the tenth year, assuming the current 25-percent depreciation rate for utility equipment, and assuming a 10-percent increase in the County-wide budget, the local tax rate or tax multiplier would rise from the 79.5 percent in the first year to 89.1 percent, or 12 percent. While overall taxes go up, the tax per kWh goes down, dropping to 1.08 cents.

Table 2: Impacts of Property Tax on Wind-Energy Equipment in Lincoln County with 3 Percent, 20 Percent, and 40 Percent Depreciation

	3 Percent Depreciation			25 Percent Depreciation			40 Percent Depreciation		
	100 MW	200 MW	425 MW	100 MW	200 MW	425 MW	100 MW	200 MW	425 MW
Lincoln County-wide Tax Multiplier	137%	137%	137%	137%	137%	137%	137%	137%	137%
Lincoln County Tax Capacity(1994)	$3,641,315	$3,641,315	$3,641,315	$3,641,315	$3,641,315	$3,641,315	$3,641,315	$3,641,315	$3,641,315
Total Lincoln County budget (est.)	$4,988,602	$4,988,602	$4,988,602	$4,988,602	$4,988,602	$4,988,602	$4,988,602	$4,988,602	$4,988,602
Additional Tax Capacity of Wind	$3,257,260	$6,514,520	$13,843,355	$2,518,500	$5,037,000	$10,703,625	$2,014,800	$4,029,600	$8,562,900
Adjusted Tax Multiplier-same budget	72.31%	49.12%	28.53%	80.99%	57.48%	34.78%	88.20%	65.03%	40.88%
Adjusted Tax Multiplier-10% increase in budget	79.54%	54.03%	31.38%	89.08%	63.23%	38.25%	97.02%	71.54%	44.96%
Adjusted Tax Multiplier-20% increase in budget	86.78%	58.94%	34.24%	97.18%	68.98%	41.73%	105.84%	78.04%	49.05%
Adjusted Tax Multiplier-50% increase in budget	108.47%	73.68%	42.80%	121.48%	86.23%	52.16%	132.30%	97.55%	61.31%
Adjusted Tax(cents/kWh) same budget	1.13	0.77	0.45	0.98	0.70	0.42	0.85	0.63	0.40
Adjusted Tax(cents/kWh) 10% increase in budget	1.25	0.85	0.49	1.08	0.77	0.46	0.94	0.69	0.44
Adjusted Tax(cents/kWh) 20% increase in budget	1.36	0.92	0.54	1.18	0.84	0.51	1.02	0.76	0.48
Adjusted Tax(cents/kWh) 50% increase in budget	1.70	1.15	0.67	1.47	1.04	0.63	1.28	0.94	0.59

A great deal of information is contained in Table 2. Here we highlight a few items.

The amount of wind capacity is a critical element in determining the tax per kWh. Assuming a 25-percent depreciation rate and a 10-percent increase in the County-wide budget, the tax per kWh for a 100-MW wind facility is 1.08 cents. For a 200 MW facility it drops to .77 cents and for a 425 MW facility it drops to .46 cents.

Depreciation matters less than the size of the wind-electric facility. For example, if depreciation were to rise from 3 percent to 25 percent for a 100-MW facility the tax per kWh would fall from 1.25 to 1.08 cents. But if the wind facility were to expand to 425 MW, the tax per kWh drops from 1.25 to .49 cents per kWh under the 3-percent depreciation schedule and from 1.08 to .46 cents under the 25-percent depreciation schedule.

County-wide spending matters. If County-wide budget increases from 10 percent to 50 percent, the tax per kWh for a 100 MW wind facility using a 3-percent depreciation rate would rise from 1.25 cents to 1.70 cents. Using a 25-percent depreciation rate it would rise from 1.08 to 1.47 cents per kWh. However, the impact on the tax per kWh of a rise in County spending diminishes as the scale of the wind facility expands. For a 425-MW facility, an increase in the County budget from 10 percent to 50 percent using a 3-percent depreciation rate raises the tax per kWh from .49 to .67 cents. With a 25-percent depreciation, it rises from .46 to .63 cents per kWh.

For purposes of comparing options we assume a zero-percent and 10-percent increase in the County-wide budget and a 3-percent depreciation. For a 100-MW wind facility, assuming an increase in County-wide budgets of 10 percent or $500,000 there would be an additional reduction in residential taxes of $410,000. The tax per kWh is 1.25 cents. For a 200-MW facility the numbers would be $590,000 and .85 cents, respectively. For a 425-MW facility they are $755,000 and .49 cents, respectively.

B. Establish a New 1 Percent Class Tax Rate for Renewable Electricity

By exempting wind equipment from assessment, the state has already created a two-tiered utility class tax rate. Some wind developers have proposed a renewable electric property tax class rate of 1 percent. This is the rate currently used in Alameda County, although the reason for this had little to do with wind power. Proposition 13, established by a statewide referendum in the late 1970's, limited property tax rates to this level.[23]

Table 3 shows the impact on Lincoln County taxes of a 1-percent utility class tax rate with a 3-percent depreciation on the equipment.

Table 3: Impacts on Lincoln County of a Tax Based on a 1-Percent Class Tax Rate for Wind Power

	100 MW	200 MW	425 MW
Lincoln County-wide Average Tax Multiplier	137%	137%	137%
Lincoln County-wide Tax Capacity(1994)	$3,641,315	$3,641,315	$3,641,315
Lincoln County-wide Budget (est.)	$4,988,602	$4,988,602	$4,988,602
Estimated Market Value of Wind Turbine	$250,000	$250,000	$250,000
Number of Turbines (73 turbines per 25 MW)	292	584	1,241
Total Value of Turbines	$73,000,000	$146,000,000	$310,250,000
Class Tax Rate	1.0%	1.0%	1.0%
Additional Tax Capacity of Turbines	$708,100	$1,416,200	$3,009,425
Total kWhs per year	208,050,000	416,100,000	884,212,500
Adjusted Tax Multiplier- same budget	114.7%	98.6%	75.0%
Adjusted Tax Multiplier- 10% increase in budget	126.2%	108.5%	82.5%
Adjusted Tax- same budget	$812,162	$1,396,903	$2,257,316
Adjusted Tax(cents/kWh) same budget	0.39	0.34	0.26
Adjusted Tax- 10% increase in budget	$893,378	$1,536,593	$2,483,048
Adjusted Tax(cents/kWh) 10% increase in budget	0.43	0.37	0.28

At 100 MW of wind development, the reduction in the local tax rate or tax multiplier, assuming a 10-percent increase in County-wide government expenditures and a 3-percent depreciation, would be 11.5 percent. The tax per kWh generated would be .44 cents. At 200 MW these numbers change to 29.4 percent, $222,000 savings and .38 cents per kWh, respectively. At 425 MW development, the local tax rate or tax multiplier drops by 55.6 percent and the tax per kWh falls to .29 cents.

C. Establish A Phased-in Tax

Wind-generation systems are about as expensive as conventional power systems, but because wind is intermittent, they generate less electricity on an annual basis. A utility tax is based on the market value of the equipment. Its impact is spread out over the amount of electricity that equipment generates. Therefore wind turbines will pay a higher tax per kWh. To offset this penalty it might be possible to phase in the tax on windpower. Wind developers depreciate their equipment rapidly for income tax purposes. After five years they expect to begin to generate a reliable revenue stream. A phased-in tax could be matched to the expected profitability of the wind developments.

Iowa has adopted this kind of tax policy for wind energy.[24] In Iowa, wind-power equipment is valued at an increasing rate of 5 percent per year, reaching the maximum 30 percent in the seventh year. In other words, in Iowa when wind equipment is fully valued in the seventh year, it is 70 percent depreciated whereas under the current utility tax rate in Minnesota, wind equipment in the tenth year will be depreciated by about 25 percent, which is equivalent to being valued at 75 percent of the original cost.

Table 4 shows the impact on Lincoln County of adopting the Iowa increasing-valuation tax strategy. We have used the Minnesota utility class tax rate of 4.6 percent for comparison purposes.

Table 4: Impacts on Lincoln County Taxes and Cost per kWh of a Wind-Energy Tax Based on Iowa's Valuation Schedule

Equipment Age	Wind Value Factor	100 MW		200 MW		425 MW	
		Cents per kWh	Tax Change	Cents per kWh	Tax Change	Cents per kWh	Tax Change
1	0%	0.00	10%	0.00	10%	0.00	10%
2	5%	0.11	5%	0.11	1%	0.10	-8%
3	10%	0.22	1%	0.21	-7%	0.17	-21%
4	15%	0.32	-4%	0.29	-14%	0.23	-31%
5	20%	0.41	-7%	0.36	-20%	0.27	-39%
6	25%	0.49	-11%	0.42	-25%	0.31	-45%
7	30%	0.57	-14%	0.46	-29%	0.34	-50%

Table 5: Impacts on Lincoln County of Phased-in Tax on Foundation and Tower

	100 MW		200 MW		425 MW	
	Year 1-5	Year 6-beyond	Year 1-5	Year 6-beyond	Year 1-5	Year 6-beyond
Lincoln County Tax Capacity	$3,641,315	$3,641,315	$3,641,315	$3,641,315	$3,641,315	$3,641,315
Lake Benton Township Tax Capacity	$170,084	$170,084	$170,084	$170,084	$170,084	$170,084
Lake Benton School District Tax Capacity	$799,892	$799,892	$799,892	$799,892	$799,892	$799,892
Lincoln County budget	$2,135,079	$2,135,079	$2,135,079	$2,135,079	$2,135,079	$2,135,079
Lake Benton Township Budget	$13,130	$13,130	$13,130	$13,130	$13,130	$13,130
Lake Benton School District Budget	$444,749	$444,749	$444,749	$444,749	$444,749	$444,749
Lincoln County Tax Rate	58.63%	58.63%	58.63%	58.63%	58.63%	58.63%
Lake Benton Township Tax Rate	7.72%	7.72%	7.72%	7.72%	7.72%	7.72%
Lake Benton School District Tax Rate	55.60%	55.60%	55.60%	55.60%	55.60%	55.60%
Other Tax Rate	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
Total Current Tax Rate	122.55%	122.55%	122.55%	122.55%	122.55%	122.55%
Estimated Market Value of Foundation/Tower	$25,000	$75,000	$25,000	$75,000	$25,000	$75,000
Number of Foundation/Towers	292	292	584	584	1,241	1,241
Market Value of Foundation/Towers	$7,300,000	$21,900,000	$14,600,000	$43,800,000	$31,025,000	$93,075,000
Class Tax Rate	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%
Additional Tax Capacity of Foundation/Towers	$335,800	$1,007,400	$671,600	$2,014,800	$1,427,150	$4,281,450
Adjusted County Tax Rate-same budget	53.68%	45.93%	49.50%	37.75%	42.12%	26.95%
Adjusted Township Tax Rate-same budget	2.60%	1.12%	1.56%	0.60%	0.82%	0.29%
Adjusted School Tax Rate-same budget	39.16%	24.61%	30.22%	15.80%	19.97%	8.75%
Adjusted Other Tax Rate-same budget	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
Total Adjusted Tax Rate-same budget	96.03%	72.24%	81.88%	54.74%	63.51%	36.59%
Tax Change-Lake Benton - same budget	-21.6%	-41.1%	-33.2%	-55.3%	-48.2%	-70.1%
Tax Change Outside Lake Benton-same budget	-4.0%	-10.4%	-7.5%	-17.0%	-13.5%	-25.9%
Total Adjusted Tax Rate-Lake Benton-10% increase	105.6%	79.4%	90.0%	60.2%	69.8%	40.2%
Tax Change in Lake Benton-10% increase	-13.9%	-35.2%	-26.6%	-50.9%	-43.0%	-67.2%
Tax Change Outside Lake Benton-10% increase	6.0%	-1.0%	2.0%	-9.0%	-5.0%	-18.0%
Tax on Foundations/ Towers-same budget	$322,471	$727,766	$549,897	$1,102,903	$906,343	$1,566,420
Tax on Found/Towers (¢/kWh)-same budget	0.16	0.35	0.13	0.27	0.10	0.18
Tax on Found/ Towers-10% increase	$354,520	$799,949	$604,490	$1,212,005	$996,135	$1,720,536
Tax on Found/Towers (¢/kWh)-10% increase	0.17	0.38	0.15	0.29	0.11	0.19

As Table 4 reveals, this type of taxation actually increases the taxes paid by local businesses, farmers and households in the early years, if the County budget increases even modestly. Even in the seventh year, when the property is assessed at its highest value, the reduction in the County's taxes is: 14 percent, 29 percent and 50 percent at 100 MW, 200 MW and 425 MW respectively. When fully phased in, the tax per kWh is 0.57 cents, 0.46 cents and 0.34 cents at 100 MW, 200 MW, and 425 MW, respectively.

D. Establish a Phased-In Tax on Wind Facility Foundation and Tower

In 1994 the state legislature exempted LS Power's proposed 232-MW natural gas-fired cogeneration plant at Cottage Grove, MN, from attached machinery taxes.[25] LS Power must pay taxes on the land and the buildings but not on the machinery.[26]

If wind power facilities were treated in a similar manner, only the concrete pad at the base of the turbine and possibly the tower would be taxed. Table 5 shows the impact of a tax on the foundation in years 1 through 5 and a tax on the foundation and turbine in year 6 and beyond.

In Table 5 we also, for the first time, break out the tax savings by each taxing district of the County. We show the tax benefits to all residents in Lincoln County and to the residents of Lake Benton township and school district. Slightly less than half of the tax benefits(55.60 percent of the 122.55 percent local tax rate or tax multiplier) would accrue to the school district. About the same amount would accrue to the the residents of the entire county. Data at the bottom of the table reveal that a 100 MW wind farm in its early years, assuming the county-wide budgets remain the same, would generate about $322,000 in additional taxes in the early years and $727,000 in taxes in years 6 and beyond.

Table 6 shows the varying impact on Lake Benton residents and those living outside the Lake Benton township and Lake Benton school district taxing areas. Assuming that government budgets remain the same, in the first few years in which just the wind facility's foundation is taxed, a wind farm of 100 MW would reduce taxes for Lake Benton residents by about 22 percent while only reducing the taxes of those living outside of Lake Benton by about 4 percent. In year 6 and later, when the foundation and the tower are taxed, the reduction in taxes for residents of Lake Benton's township and school district would be 41 percent while for those living outside that area it would be only 10 percent.

Table 6: Distribution of Wind Energy Tax Benefits Within Lincoln County

		100 MW Percentage Change inTaxes		200 MW Percentage Change inTaxes		425 MW Percentage Change inTaxes	
		Same budget	10% increase	Same budget	10% increase	Same budget	10% increase
Lake Benton	Year1-Year 5	-22%	-14%	-33%	-27%	-48%	-43%
	Year 6-beyond	-41%	-35%	-55%	-51%	-70%	-67%
Outside Lake Benton	Year1-Year 5	-4%	6%	-7%	2%	-13%	-5%
	Year 6-beyond	-10%	-1%	-17%	-9%	-26%	-18%

A summary of the most relevant data in Table 5 is presented in Table 7. In this table we have not broken out the distribution of tax benefits within the County. Instead we show the aggregate benefit on a County-wide basis. In years one through five, a 100 MW wind farm would pay .16 cent per kWh in taxes. It would generate about $322,000 annually in tax benefits and, assuming no increase in County-wide budgets, would reduce taxes on existing properties by 7 percent. In years 6 and beyond the tax on a 100 MW wind farm would generate about $728,000 in tax benefits annually. Assuming no increase in government budgets, this would lower existing taxes by 15 percent. The tax per kWh would rise to .35 cents.

Table 7: Summary of Impacts of Phased-in Tax on Foundation and Towers

	100 MW		200 MW		425 MW	
Time Frame	Same budget	10% increase	Same budget	10% increase	Same budget	10% increase
Year1-Year 5 (cents per kWh)	0.16	0.17	0.13	0.15	0.10	0.11
Year1-Year 5 (dollars per year)	$322,471	$354,520	$549,897	$604,490	$906,343	$996,135
Overall Change in Taxes (percent)	-6%	3%	-11%	-2%	-18%	-10%
Year 6-beyond (cents per kWh)	0.35	0.38	0.27	0.29	0.18	0.19
Year 6-beyond (dollars per year)	$727,766	$799,949	$1,102,903	$1,212,005	$1,566,420	$1,720,536
Overall Change in Taxes (percent)	-14%	-6%	-22%	-14%	-31%	-24%

In the early years the tax per kWh for a 200 MW wind farm would be .13 cent and the reduction in countywide taxes would be 11 percent. In years 6 and beyond the tax per kWh would rise to .27 and the reduction in countywide taxes would be 22 percent.

E. Establish a Flat Payment per kWh

A precedent exists for the state to impose a flat royalty payment on wind-energy. Minnesota imposes a $2.054 per ton tax on taconite mined in 1992, 1993, and 1994.[27] That tax was enacted to create an investment fund that would enable the Iron Range to diversify its economic base away from a heavy dependence on a declining taconite industry. A similar tax on production could be applied to the electricity generated from wind turbines. Indeed, there is a certain symmetry to this suggestion. The highest wind-speed areas of Minnesota are in the opposite corner of the state from the Iron Range and these rural communities are among the poorest in the state.

A royalty tax could be based on actual electric generation. Such a tax would be easy to administer but might leave the County in a somewhat uncertain fiscal situation because the revenue stream in any given year depends entirely on the performance of the wind equipment. A more attractive approach might be

to establish a "normalized" tax. This tax would be based on an anticipated quantity of electricity generated. The amount of electricity taxable would be based on the operating efficiencies of the average wind turbine.

For example, the present generation of wind turbines expect to achieve a 25-percent capacity factor. That means that 25 percent of the time the power plant will operate at its nameplate capacity. Thus a 1 kW machine would generate 1 times 8760 hours in a year times .25 or 2190 kWh per year.[28] The royalty payment would be payable on 2190 kWh per year. A developer who designs and operates a machine that extracts more electricity from the wind than this amount would not pay a tax on the additional electricity. Or another way of looking at this is that the same tax payment would be spread out over more kWhs and thus the tax per kWh would be lower.

A flat tax rate per kWh differs from other kinds of taxes because it would not affect the tax capacity of the county. The revenue from this type of tax could go into a county's general fund or it could be dedicated to a specific purpose (e.g., for local economic development or to expand renewable electricity). Table 8 shows the impact of a .3 cent per kWh flat payment.

Table 8: Impacts on Lincoln County of a Flat Payment of .3 Cent per kWh

	100 MW	200 MW	425 MW
Capacity Factor	25%	25%	25%
Availability	95%	95%	95%
kWhs per Year	208,050,000	416,100,000	884,212,500
Tax per kWh (cents)	0.30	0.30	0.30
Tax per Year	$624,150	$1,248,300	$2,652,638
Tax Reduction-same budget	12%	25%	53%
Tax Reduction-10% increase	2%	15%	43%
Tax per Megawatt	$6,242	$6,242	$6,242

As Table 8 shows, a 100 MW wind farm would generate $624,000 in tax benefits annually. A 200 MW and 425 MW wind farm would generate two times and 4.25 times as much tax benefit. Indeed, since this is a flat tax, one can predict the revenue generated by multiplying the number of megawatts by $6242.

Assuming the government budgets remain the same, a 100 MW wind farm would reduce existing taxes by 12 percent, a 200 MW wind farm by 25 percent and a 425 MW wind farm by 53 percent.

SECTION III:
TOWARD A FAIR TAX SYSTEM FOR WIND ENERGY

As was stated in the beginning of this report, a fair tax policy for wind energy should balance four interests: the desire by ratepayers to pay the lowest possible price for electricity; the desire by wind developers to maximize their financial returns and accelerate wind electric development; the desire by county residents to maximize their financial benefit from local wind-electric development and; the desire by Minnesota to accelerate wind-energy development inside the state.

We address these issues in turn.

Ratepayers desire the lowest possible price for electricity. Customers now pay a slight premium for using wind power.[29] According to NSP the impact on electric rates of a 100-MW wind farm where the wind electricity is purchased at 4.5 cents per kWh is about $0.00027 per kWh. An average residential customer would pay about $2.00 more a year or less than one half of one percent more for electricity. The wind industry anticipates that by the end of the decade or before, wind energy will be competitive with most if not all forms of conventional power.

Assuming that a tax on wind-electricity per kWh is no higher than the existing utility tax on conventional power, a wind-energy tax would not raise the price of electricity any higher than it would have been without the wind-energy.

Wind developers want to accelerate wind-electric development and Minnesota officials want to ensure that that development occurs within the state. It should be noted that any tax rate on wind-power equipment would apply statewide but the renewable-electric mandate applies only to power purchased or produced by NSP. Outside of NSP's territory, wind developers still will compete with conventional power producers.

In addition, the wind mandate may not require that all 425 MW be generated inside Minnesota. Depending on one's interpretation of the existing laws, 200 MW might be generated in South Dakota or other nearby windy states for sale to NSP.[30]

Thus among the issues to be addressed are whether a tax imposed on Minnesota wind power plants would discourage wind developers from selling to markets other than NSP or whether a tax imposed on wind energy would encourage developers to establish wind farms in other states and transmit the electricity back to Minnesota.

A. Competing With Fossil-Fueled Power Plants

Would a tax on wind power hinder wind-electric sales to utilities other than NSP? The answer to this question depends on those utilities' planned future power purchases, whether these purchases will be for baseload, intermediate or peaking power, what the cost of that power will be, what the cost of wind power will be at that time, and what the value of wind electricity is with respect to baseload, intermediate and peaking power.

To provide detailed answers to these questions is outside of the scope of this report. It may be useful, however, to note the differing impacts of a utility tax on wind turbines and conventional power plants. Table 9 provides the range of taxes per kWh for conventional power plants, based on a 10-percent increase in the budget and Lincoln County data.

Table 9: Cost per kWh of 4.6-Percent Tax on Fossil-Fueled Power Plants

	100 MW (cents per kWh)		200 MW (cents per kWh)		425 MW (cents per kWh)	
	3% Depreciation	25% Depreciation	3% Depreciation	25% Depreciation	3% Depreciation	25% Depreciation
Coal Fired-70% Capacity ($2000 per kW)	0.64	0.59	0.37	0.35	0.19	0.19
Natural Gas-30% Capacity ($800 per kW)	1.00	0.90	0.69	0.63	0.40	0.37
Natural Gas-70% Capacity ($800 per kW)	0.44	0.39	0.30	0.27	0.17	0.16

As we can see from Table 9, the tax per kWh for conventional power plants depends on their capital cost per kilowatt, whether they are used as a baseload or intermediate load plant, and how big the plant is. Depreciation doesn't significantly affect the conclusions. The tax in cents per kWh ranges from a high of 1.0 cent for a natural gas power plant that operates 30 percent of the time to a low of .16 cent for a natural gas plant that operates 70 percent of the time.[31] Coal gasification plants will tend to be built in the 300-500-MW range while natural gas power plants will tend to be built in the 50-200-MW range. Thus the 200 MW figures from the table may represent the most realistic estimates of the impact of the existing 4.6 percent utility tax on future fossil fueled power plants. These are in the .27-.63 cent per kWh range.

Since state policy is to encourage wind-energy development, Minnesota would not want to tax wind energy at a higher rate per kWh than fossil fueled power plants. This would put wind energy at a competitive disadvantage with conventional power plants. On the other hand, given the wind-energy mandate, it is unclear whether wind-energy should be taxed at a significantly lower rate than conventional power. A tax in the range of .2-.3 cent per kWh appears reasonable.

Because of the mandate for wind-electricity wind-energy developers will for the next few years be competing against one another and not against conventional power plants. Therefore one can argue that a tax on wind-energy can and will be passed along to the electricity customer just as are existing taxes on utility power plants. Thus wind-energy developers' profits should not suffer.

However, wind development may be burdened by high energy taxes in another more indirect manner. Wind-energy development will probably occur under independent ownership. Therefore bids will have to include the cost of taxes. Wind developers point out that if taxes are high, the bid prices may be much higher and the general public may get the impression that wind energy is more expensive than it actually is. That misleading impression could undermine support for wind-electricity.

B. Competing With Iowa and South Dakota

Both Iowa and South Dakota tax electricity at a lower rate than does Minnesota. South Dakota uses a unit-value approach similar to that used by the Minnesota Department of Revenue to determine utility property values. In South Dakota the average tax rate is 2.6 percent for nonagricultural property, about 75 percent of Minnesota's effective rate of 3.45 percent, after 25 percent depreciation.[32]

Iowa, another windy state, offers special provisions for wind energy equipment. Beginning in 1994, wind equipment in the first year is valued at zero. For the second through the sixth years, the wind equipment is assessed at a rate that increases by five percent a year. Beyond six years, the property will be valued at 30 percent.[33] In Iowa's Buena Vista County, an area with high wind potential, the average tax rate is 2.35 percent.[34] Thus the resulting effective utility rate for wind power would be zero in the first year rising in the seventh year to a maximum .7 percent. This is about 20 percent of Minnesota's effective rate of 3.45 percent.

Whether the lower tax rates in Iowa and South Dakota would lead wind developers to set up in those states rather than Minnesota may depend on the cost of transmitting their electricity back to NSP. The Federal Energy Regulatory Commission (FERC) recently established a transmission service charge in the Mid-Continental Area Power Pool (MAPP) region. The rates will be phased in over time. The rates vary significantly and are based on a complex formula. The lowest tariff in the MAPP region is between Wisconsin Public Power and Minnesota Power at $0.26 per kilowatt per month. The highest tariff is between Minnkota Power in North Dakota and Muscatine Electric in Iowa at $1.348 per kilowatt per month. These transmission tariffs very roughly translate into a cost of transmitting electricity of .03 cent per kWh and .19 cent per kWh, respectively.[35]

These figures assume that wind electricity can be transmitted over existing transmission lines. If new or upgraded transmission lines are required, the costs would be much higher.[36]

Table 10 compares the tax per kWh for wind energy, based on the Iowa and South Dakota and Minnesota rates. In all three cases, Lincoln County's actual budget and tax-capacity data are used.[37] As we can see from the table, in the worst-case scenario in the early years when Iowa is not taxing wind power and Minnesota is taxing at 4.6 percent with a minimum of depreciation, the difference in the tax per kWh between Iowa and Minnesota is over 1.2 cents. This would be greater than the cost of transmission, assuming that existing transmission lines had sufficient capacity. The difference between South Dakota's and Minnesota's taxes is much smaller, about .35 cents per kWh. At 200 MW the fraction of a cent difference in taxes per kWh in South Dakota is offset by the transmission costs and even in Iowa, once the full 30 percent valuation is taken, it appears that transmission costs could largely offset the difference in taxes. More analytical work needs to be done in this area to refine these very rough numbers.

Table 10: Comparison of Minnesota, South Dakota, and Iowa Tax Rates on Wind- Power Development in Lincoln County

	100 MW	200 MW	425 MW
	(cents per kilowatt-hour)		
SD Tax Rate-2.6 percent (97% of market value)	0.8¢	0.66¢	0.42¢
SD Tax Rate-2.6 percent (75% of market value)	.74¢	.53¢	.35¢
IA Tax Rate-2.3 percent (0% of market value)	0¢	0¢	0¢
IA Tax Rate-2.3 percent (30% of market value)	0.32¢	0.29¢	0.21¢
MN Tax Rate-4.6 percent (97% of market value)	1.25¢	0.85¢	0.49¢
MN Tax Rate-4.6 percent (75% of market value)	1.08¢	0.77¢	0.46¢

Table 10 shows that Iowa taxes wind-energy at .21-.32 cent per kWh. South Dakota taxes wind-energy at .35-.74 cent per kWh. It appears that a tax of .3 cent per kWh or even higher on wind-energy in Minnesota would not encourage developers to generate electricity outside of Minnesota and transmit it back to this state.

SECTION IV: CONCLUSIONS

What is a fair tax policy for wind energy? A fair tax must provide significant and enduring financial benefits to the rural host community while not hindering the rapid growth of wind-energy development in Minnesota.

Table 11 provides an overview of the impacts on wind-energy developers and the local community of the five tax strategies discussed in this report.[38] For more detailed information on these strategies, the reader can refer back to Section III.

Table 11: Impacts on Lincoln County Taxes and the Cost per kWh of Various Tax Strategies (Assuming no budget increase)

	100 MW			200 MW			425 MW		
Tax Strategy	Tax Reduction	Tax per kWh (¢)	Tax (dollars)	Tax Reduction	Tax per kWh (¢)	Tax (dollars)	Tax Reduction	Tax per kWh (¢)	Tax (dollars)
Existing 4.6% tax rate-(3% Depreciation)	47%	1.13	$2,350,965	71%	0.85	$3,536,850	87%	0.49	$4,332,641
Existing 4.6% tax rate-(25% depreciation)	41%	0.98	$2,038,890	64%	0.77	$3,203,970	81%	0.46	$4,067,378
1% tax rate-(3% depreciation)	16%	0.39	$811,395	31%	0.37	$1,539,570	50%	0.28	$2,475,795
1% tax rate-(25% depreciation)	13%	0.31	$644,955	23%	0.28	$1,165,080	39%	0.22	$1,945,268
Based on Iowa's Tax Policy	22%	0.52	$1,081,860	36%	0.43	$1,789,230	55%	0.31	$2,741,059
Phased-in 4.6% Tax on Tower/Found.-Year 1-5	7%	0.16	$332,880	11%	0.13	$540,930	18%	0.10	$884,213
Phased-in 4.6% Tax on Tower/Found-Year 6-on	15%	0.35	$728,175	22%	0.27	$1,123,470	32%	0.18	$1,591,583
Flat Payment per kWh	12%	0.30	$624,150	25%	0.30	$1,248,300	53%	0.30	$2,652,638

There are three general broad strategies for taxing wind-energy. One varies the utility class tax rate from the current 4.6 percent. Another varies the value of the wind-energy facility. The third imposes a flat tax or royalty per unit of electricity generated.

As we can see, using a 4.6 percent tax rate based on the current method of valuing utility property would generates very substantial financial benefits to the local community while imposing a very high tax on wind-energy facilities. The community receives $2.0-2.3 million in tax benefits even at the 100 MW level but the tax per kWh is .98-1.13 cent.

A 1 percent tax rate generates a smaller financial benefit to the local community but also imposes a smaller cost per kWh to the wind-energy developer. For a 100 MW wind farm the local community would receive $645,000-$811,000. Its taxes could be reduced by 13-16 percent, assuming no increase in county-wide budgets. The tax per kWh would be .31-.39 cent at the 100 MW level, falling to .28-.37 cent per kWh at the 200 MW level.

A phased-in tax on wind-energy which uses the existing 4.6 percent utility class tax rate but taxes only the foundation in years 1 through 5 and then the foundation plus the tower in year 6 and afterwards generates a modest financial benefit to the community and a varying cost per kWh to the wind-energy developer. At the 100 MW scale, the revenue for the first few years would be about $330,000. When the foundation plus the tower are taxed, the revenue to the local community rises to about $730,000. Assuming no county-wide budget increase, taxes could be reduced by 7-15 percent at the 100 MW level, rising to 11-22 percent at the 200 MW level. The tax per kWh in the first five years would be .16 cent and afterward would be .35 cent.

As Table 11 shows, by varying the tax rate or varying the valuation of the wind-energy facility, the tax per kWh and the income generated for the community varies. The tax per kWh under the phased in foundation and then foundation and tower tax strategy would see the tax per kWh fluctuate from .10-.35 over the years.

A flat payment per kWh would eliminate this fluctuation. Wind-energy developers would know what their tax per kWh would be. A flat tax of .3 cent per kWh would generate about $620,000 the first year of a 100 MW wind farm and would allow existing taxes to be reduced by 12 percent. A 200 MW would generate $1.25 million and allow taxes to be reduced, assuming no increase in county-wide budgets, by 25 percent.

Comparing the flat tax and the phased-in foundation and tower tax strategy, we see that at the 100 MW level the former generates significantly more money for the county in the early years when only the foundation is taxed and generates slightly less financial benefits for the county after the foundation and the tower are taxed.[39] As the wind farm size grows to 200 MW the flat payment generates significantly more revenue than taxing only the foundation and and slightly more revenue than taxing the foundation and the tower. At 425 MW the flat payment method generates 1.5-3.0 times more revenue for the county.[40]

NOTES

[1] Minnesota Statutes §272.02, subdivision 1, section 21 exempts from property tax wind energy conversion systems installed after January 1, 1991. Minnesota Statutes §500.30, subd. 5 reads: "Any depreciation caused by any solar or wind easement which is imposed upon designated property, but not any appreciation caused by any easement which benefits designated property, shall be included in the net tax capacity of the property for property tax purposes."

[2] According to NSP, there are 31 active homesteads in the proposed site in Lincoln County for the next 100 MW wind farm in that county and 33 active homesteads in the proposed 100 MW site in Pipestone County.

[3] Many landowners in the Buffalo Ridge area have signed contracts which effectively sell their wind rights in perpetuity. In this case the payment to the farmer is made in a lump sum up front. NSP is expected to pay a one-time lump-sum of $5,150,000 for wind easements for the 100-MW facility. In the Matter of Application of Northern States Power Company for a Certificate of Need for Approximately 100 Megawatts of Wind Generation, *Proposed 100 MW Wind Energy Generation Facility*, Docket No. E-002/CN-94-795, September 23, 1994, page 17. This sum is for access in perpetuity so the annual benefit to the landowner could be quite low. Also, since landowners have given away perpetual access to 3-5 percent of their land, the market value of that land declines. A buyer would not have access to that land nor would he or she receive revenue from the wind-electricity generated by machines on that land. The higher figure of $3.5 million is based on a payment equivalent to 8 percent of the gross operating revenues (over 25 years). This is based on contracts negotiated in California.

[4] This report does not address the issue of whether that policy might be changed. Utility tax policies vary by state. In neighboring Wisconsin, for example, utility tax revenue goes to the state and is redistributed back to communities. Communities which host power plants receive a larger share of the revenue.

[5] The first $100,000 of utility property is taxed at 3 percent.

[6] For comparative purposes, NSP's Prairie Island nuclear facility, with a capacity of 1060 MW, generates over $22,000,000 in property taxes within Goodhue County. The plant and its attached machinery constitute approximately two-thirds of the tax capacity of the city of Red Wing. Conversation with Brad Johnson, Goodhue County Assessor, December 5, 1994.

[7] Government officials call this the local tax rate in contrast to the class or state tax rate. We coined the term "tax multiplier" to distinguish it from the class tax rate.

[8] Conversation with Bob Anderson, Lincoln county Assessor, December 13, 1994.

[9] Market value is set by the county, except for certain utility and railroad properties, which are set by the Department of Revenue. The class tax rate is fixed by the state. Currently, there are dozens of property types that have designated class tax rates.

[10] This report focuses on the impact of wind development in Lincoln County, the rural area most immediately affected by wind electric development. Lincoln County had a 1990 population of 6,890, per capita income of $9,616 and a land area of 537 square miles.

[11] There are actually several class tax rates for different types and values of residential property.

[12] The actual utility tax rate is 3 percent on the first $100,000 of equipment and 4.6 percent on the value of the equipment in excess of $100,000. In our calculations and tables we apply the 4.6 percent to the entire value of the utility equipment.

[13] Conversation with Dean Sagmoe, Lincoln county Auditor, 10/19/94. Tax rates actually vary depending on the individual taxing district. Thus they could be over 100 percent in one school district and less than 100 percent in another.

[14] Minnesota Department of Revenue.

[15] This report is based on Minnesota's philosophy of utility taxing. Minnesota's utility taxes are designed to reward local communities willing to host the power plants. Other states have different policies. For example, Wisconsin imposes a gross revenue tax on utilities that goes into the general fund. A portion of that money is allocated back to those cities and counties which host power plants. In Minnesota all the utility customers pay slightly higher rates

and this money is channeled to a few taxpayers in the community surrounding the power plant.

[16] This table does not take into account utility equipment depreciation. This is discussed in detail under the alternative tax policies section of the report.

[17] This is the tax capacity of all taxing districts. The county government's share of this is 45-50 percent of the total.

[18] Lincoln County has added one additional staff person at the Recorders office to handle the increased flow of paper connected with land acquisition activities. Altamont Pass in Alameda county, California is home to about 41 percent (700 MW) of California's wind-power capacity (*WindStats Newsletter*, Winter 1994, Vol. 7, No. 1, p. 4). Alameda County officials say there has been a modest increase in road or administrative expenses related to that development.

[19] There is at least one other aspect in this debate to consider. That is the issue of how the value of windy land will change in the future. The Lincoln County assessors office has stated that they will rely solely on historical data in determining property values. They will not speculate as to the increase or decrease in the value of land that has or will likely be a location for a wind tower. It will take several years before any adjustments are made to property values depending on how many real-estate transactions occur. Presentation by Bob Anderson, Lincoln County Assessor, Environmental Quality Board's Power Plant Siting Advisory Task Force on Wind Power in Minnesota. November 18, 1994.

[20] Conversation with Al Whipple, Minnesota Department of Revenue. Actually there is one further step in estimating tax capacity. Since NSP supplies electricity to other states as well as Minnesota, only 85 percent of the value of the utility property is allocated to Minnesota.

[21] Conversation with Al Turner, Supervising Auditor/Appraiser, Alameda County assessors office. December 6, 1994.

[22] It should be noted that in our tabular calculations we have been using the 1994 average Lincoln County-wide tax multiplier of 137 percent. Lincoln County's budget temporarily increased recently to comply with the American Disability Act. It is expected that the budget will decrease next year and the tax-rate multiplier will drop from 137 percent to 109 percent.

[23] Conversation with Al Turner, Alameda County assessors office.

[24] Actually, Iowa values all commercial and industrial property in similar fashion, that is, at a flat 30 percent of market-value rate. Conversation with Ted VanGrootheest, Buena Vista County Assessor, Storm Lake, IA. December 15, 1994.

[25] Minnesota Statutes Chapter 272.02, subd. 1 (28).

[26] The law was written so as to apply only to LS Power's project. One reason was to encourage highly efficient gas-fired power plants. But another reason was that LS Power was competing against Wisconsin-based power plants. LS Power argued that those power producers could offer a lower price because of the way the Wisconsin utility-tax system works. Furthermore, it argued that if a Wisconsin-based project were accepted, Minnesota counties would not be able to increase their tax capacity at all.

[27] Laws of Minnesota for 1994. Chapter 587. Art. 6. Sec. 3.

[28] To be more accurate, one would also take into account the availability factor of the wind turbine. That is the percent of the year the wind turbine is available for operation(i.e. is not down for maintenance or other reasons). The industry expects that current generation wind turbines will achieve 95 percent availability factors. Thus we would multiply the 2190 kWhs per year by .95 for an expected electrical generation of a l kW wind turbine of 2080 kWhs.

[29] This does not take into account the pollution costs of conventional power. These are real costs not reflected in utility rates. Such costs have been quantified in a number of states. Depending on the estimates used, when environmental impacts are considered, the cost of wind power may already be competitive with conventional power .

[30] Minnesota Statutes §216B.2423, subd. 1 (1994) states that NSP must "construct and operate, purchase, or contract to construct and operate: (1) 225 megawatts of electric energy installed capacity generated by wind energy conversion systems within the state by December 31, 1998; and (2) an additional 200 megawatts of installed capacity so generated by December 31, 2002." The words "so generated" can be interpreted as meaning that the additional 200 MW of wind power must also be located within the state. It could also mean simply that it must be windpower and the words "so generated" do not refer to a specific geographic location.

[31] The Prairie Island nuclear plants in Goodhue County are taxed at an effective rate of about .22 cents per kWh in part because they represent such a large percentage of the county's tax base, and in part because they have been depreciated by about 40 percent since their opening in 1973 and 1974.

[32] South Dakota has two property tax rates, one for agriculture and the other for nonagricultural property. Conversation with Brad Blinsmon, South Dakota Department of Revenue. December 13, 1994. To calculate the effective rate in Minnesota we used a 25-percent depreciation allowance multiplied by the class tax rate of 4.6 percent to get an effective tax rate of 3.45 percent.

[33] Iowa House File 664, 1993.

[34] Conversation with Ted VanGrootheest, Buena Vista County Assessor, December 15, 1994.

[35] This assumes a 25-percent capacity factor for wind power. This is a rough approximation because the contracts independent power producers will sign may be very complex.

[36] In the Buffalo Ridge area, NSP estimates the cost of upgrading transmission lines at $100 per kW.

[37] The actual cost per kWh would be based on the budgets and tax capacity of the South Dakota and Iowa counties in which the wind farms were set up. These rural areas would probably have similar characteristics to Lincoln County

[38] This table, as with all of those used in this report, is based on Lincoln County data and assumes a current local tax rate or tax multiplier of 137 percent which corresponds to a County-wide budget of about $5 million. Table 5 used a 122.5 percent local tax rate because that is the tax rate used in Lake Benton. That table analyzed not only the overall impact of wind-energy development on county-wide taxes but the impact on sub-county taxing districts. Table 11 is used to compare all tax strategies on a consistent basis.

[39] Our calculations do not take into account the impact on state school fund allocations. If a county were to dramatically increase its tax capacity then it is likely that it would be given a reduced allocation of school tax equalization funds. In Lake Benton, where the school district represents a very significant proportion of the overall taxing districts, this re-allocation could reduce the net financial benefit of wind farm development under almost all of the scenarios presented here. It is unclear whether school funds would be affected by revenues generated from a flat payment.

[40] The legislature would have to clarify how flat payment revenues would be allocated. Many possibilities exist. For example, in the 1970s the legislature enacted a statute that distributed taxes on transmission lines half to the general revenue fund of the county and 40 percent to the general school fund of the county. Minnesota Statutes 1994. Chap. 273.42. This kind of distribution formula would change the present situation where a single school district reaps the vast majority of the benefits from power plants.