

WIND EMPOWERMENT ZONES

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Executive Summary

The federal Empowerment Zone/Enterprise Community program was created to stimulate economic development in the hardest hit urban and rural areas. The EZ/EC program provides focused tax incentives, grants and loans to businesses that create economic activity in those areas.

This paper explores the concept of using wind power in the EZ/EC program as a way to produce sustainable economic development in rural areas. A “Wind Empowerment Zone” program could be implemented in current EZ/EC areas, could be incorporated into future EZ/EC activity, or could be created as a new and separate federal program. The most likely areas for Wind EZ status are those that have struggling economies, strong wind resources and political leadership able to make it happen.

There are a number of trends that are favorable to the Wind Empowerment Zone concept. Swings in agriculture markets and ongoing changes in farm economics have caused many rural areas to try to diversify. While some areas have succeeded, others have not. And even areas that have made progress are witnessing a shake-out of small farms.

At the same time, wind power in the US is growing rapidly, due to cost declines, state mandates and federal tax credits. Wind has expanded outside of California, with substantial wind farms built in Iowa, Minnesota, Wyoming and Texas. Continuing cost declines, new green power markets and pressure for low-emission power will likely result in more wind development in the future.

Empowerment Zones could use a number of financial tools to reduce wind farm development costs. Due to the high capital cost and low operating cost of wind farms, the most effective economic incentives are likely to be those that address financing costs, such as low interest loans, loan guarantees or tax-free bond financing.

Among currently designated Empowerment Zones, two in the Dakotas look most promising for wind development. The Steele-Griggs EZ in North Dakota and the Oglala Sioux Tribe EZ at Pine Ridge, South Dakota, may both have the potential for commercial wind farms. Other sites may also be attractive, and could be designated under future EZ/EC expansion, or in related federal programs.

To implement the Wind EZ concept, DOE and public power authorities (such as TVA and WAPA) could get involved in the existing EZ/EC program. Designation of additional EZ/EC areas would require action by Congress; wind-specific incentives could be incorporated in that legislation. It may also be possible to create EZ-like incentives for poor rural areas outside of the EZ/EC program. Promotion of biomass energy crops could be included in any programs.

I. Introduction

What is a Wind EZ?

The federal Empowerment Zone/ Enterprise Community program was created to stimulate economic development in the hardest hit urban and rural areas. The EZ/EC program provides focused tax incentives, grants and loans to businesses that locate in and hire people from those areas. The EZ/EC program is headed in rural areas by the Department of Agriculture and in urban areas by the Department of Housing and Urban Development, and is overseen by a board of cabinet-level officials, chaired by Vice President Gore.

A Wind Empowerment Zone would be a way to use the EZ/EC concept to encourage wind power specifically. Many of the rural areas hardest hit by poor farm economics are also among the most promising for wind power development. Wind can create jobs, tax revenue and sustainable economic development for these regions, in addition to substantial environmental benefits.

A Wind EZ would work by using a number of financial tools, such as tax incentives, low interest financing and federal power purchasing contracts, to encourage wind development in specific hard hit areas. It could be implemented as part of current and future EZ/EC community programs, or it could be created as a new and separate federal program. In either case, the most likely areas for Wind EZ status are those that have struggling economies, strong wind resources and political leadership willing to make it happen.

Why is it a Good Idea?

In this age of rapidly changing rural economies, economic development and diversification are important goals for rural communities. Wind power is a way to turn a rural resource into income, without resorting to short-term extractive practices that can disrupt rural communities. Wind power is compatible with rural lifestyles, and is economically and environmentally sustainable. While it has only modest potential for job creation in rural areas, it provides a stable stream of income in the form of rents to landowners and property tax payments to counties.

There are also some strong political arguments for Wind Empowerment Zones, for proponents of both rural economic development and sustainable energy. A Wind EZ connects renewable energy with farm economics, which has a much more powerful constituency. It makes the same link that supports ethanol, by making renewable energy an integral part of rural economic diversification. And it can provide a positive argument to the farm community, a traditional foe, to take action on climate change.

Like the rest of the EZ/EC program, it fits in with “New Democrat” and “Compassionate Conservative” ideals of “public-private partnerships,” of giving a “hand up instead of a hand out.” Because it is focused on poverty-stricken areas, it avoids charges of corporate welfare that have been leveled at federal aid to renewable energy. In this way, it can diversify support for wind power at a critical time. Congress is now considering an extension of the Production Tax

Credit, the Clinton Administration's proposal of a 7.5 percent Renewables Portfolio Standard and action on climate change (and eventually on the Kyoto Accord). The current wave of wind power expansion to the Midwest, Texas, Colorado and Wyoming, should increase awareness among federal policy makers of the benefits of wind development and the need for support. A Wind EZ may be an entrée to other states that have seen little or no wind development – such as North and South Dakota.

II. Background

What are Empowerment Zones?

The Empowerment Zone/Enterprise Community (EZ/EC) program was created by Congress in 1993 to help distressed urban and rural communities develop comprehensive approaches for dealing with their social and economic problems. The program in each community is guided by strategic plans composed by that community. The program also fosters partnerships with federal and state programs, private and nonprofit organizations, and others.

In Round I of the program, in December 1994, three rural areas were designated as EZs and 30 as ECs, out of 227 rural communities that applied (see Figure 1). These areas, many of which are in the South, have a rural population of 625,000 over a total area of 15,000 square miles in 24 states. On average, the poverty rate for these communities exceeds 36 percent and the unemployment rate exceeds 14 percent.

A second round of communities were designated in December 1998, based on the Taxpayer Relief Act of 1997. An additional five rural areas were designated EZs under Round II, along with 20 rural ECs. The five new rural EZs have a combined total of 83,849 residents and an average poverty rate (in the four EZs that are poverty-based) of over 37 percent. Shannon County, SD, which is included in the Oglala Sioux Empowerment Zone, is the poorest county in the United States. The fifth EZ, Grigg-Steele in North Dakota, qualified on the basis of population decline, which was approximately 25 percent during 1980-95.

The EZ/EC Initiative is guided by the Community Empowerment Board, an interagency task force chaired by Vice President Gore. The rural EZ/EC initiative is implemented by USDA Office of Rural Development. The urban EZ/EC program is headed by the Department of Housing and Urban Development. A number of federal, state and local agencies participate in the program, along with many private sector groups.

Over a 10-year period, both the EZs and the ECs will receive federal assistance through Social Services Block Grants (SSBG), special tax incentives, technical assistance, and special consideration in many federal competitive grant and loan programs. EZ and EC features are compared in Table 1.

According to GAO, federal funding for Round I of the rural EZ/EC program will total more than \$1 billion over the 10-year life of the program.¹ This amount includes the \$208 million in EZ/EC funds from the Social Services Block Grant program and an estimated \$428 million from tax incentives. Direct funding from federal, state, and local programs and private sources will be additional. USDA plans to provide about \$246 million to the rural EZs and ECs over the first four years alone and expects that its funding for the 10-year life of the program could reach \$600 million.

For Round II, the President requested \$1.7 billion in funds, which would provide each rural Zone with \$40 million over a ten-year period, the same level as in Round I. In October 1998,

Congress appropriated first year grants of \$2 million to each of the 5 rural Zones and authorized an additional 20 rural Enterprise Communities and provided them with \$250,000 in first year funding.

To qualify for the rural EZ/EC program, a community must have a population of less than 30,000, an area of less than 1000 square miles, and a poverty rate not less than 20% (or 90% of census tracts with a rate of 25% or more). Applicants are judged according to need and also to the viability of their strategic plan.

Table 1: What's The Difference Between An EZ and an EC?

	Empowerment Zone	Enterprise Community
Two Social Service Block Grants (Title XX) of \$40 million	X	
One Social Service Block Grant (Title XX) of \$3 million		X
Empowerment Zone Employment Credit, which provides qualified employers with a tax credit of up to \$3,000 for each employee who lives and works in the EZ	X	
Empowerment Zone Expensing Allowance, which allows a qualified business to take a special depreciation deduction of up to \$20,000 (for an annual total of up to \$37,500) for equipment purchases each year	X	
Enterprise Zone Facility Bond, which provides up to \$3 million in tax-exempt bond financing to qualified businesses for buildings or equipment	X	X
Technical assistance provided in strategic plan development, partnership building, and leadership development.	X	X
Increased coordination of Federal programs.	X	X

RURAL EMPOWERMENT ZONES/ENTERPRISE COMMUNITIES

ROUND 1

Empowerment Zones

Kentucky Highlands EZ (KY)
Mid-Delta EZ (MS)
Rio Grande Valley EZ (TX)

Enterprise Communities

Chambers County, AL
Greene & Sumter Counties, AL
East Central Arkansas, AR
Mississippi County, AR
Arizona Border Region, AZ
Imperial County, CA
City of Watsonville, CA
Jackson County, FL
Crisp/Dooly, GA
Central Savannah River Area, GA
Northeast Louisiana Delta, LA
Macon Ridge, LA
Lake County, MI
City of East Prairie, MO
North Delta Mississippi, MS
Halifax/Edgecombe/Wilson, NC
Robeson County, NC
La Jicarita, NM
Greater Portsmouth, OH
Southeast Oklahoma, OK
Josephine County, OR
City of Lock Haven Federal, PA
Williamsburg-Lake City, SC
Beadle/Spink/South Dakota, SD
Fayette County/Haywood County, TN
Scott/McCreary Area, TN
Accomack-Northampton, VA
Lower Yakima County, WA
Central Appalachia, WV
McDowell County, WV

ROUND 2

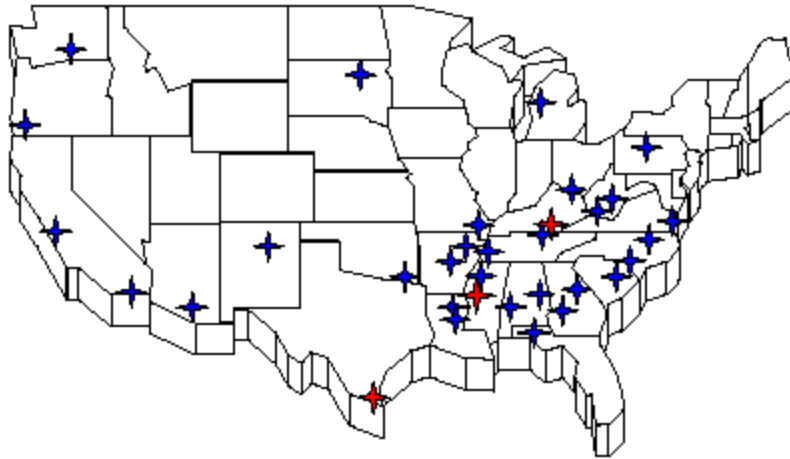
Empowerment Zones

Desert Communities EZ (Riverside County, CA)
Southwest Georgia United EZ (GA)
Southernmost Illinois Delta EZ (IL)
Steele-Griggs County EZ (ND)
Oglala Sioux Tribe EZ (Pine Ridge Res., SD)

Enterprise Communities

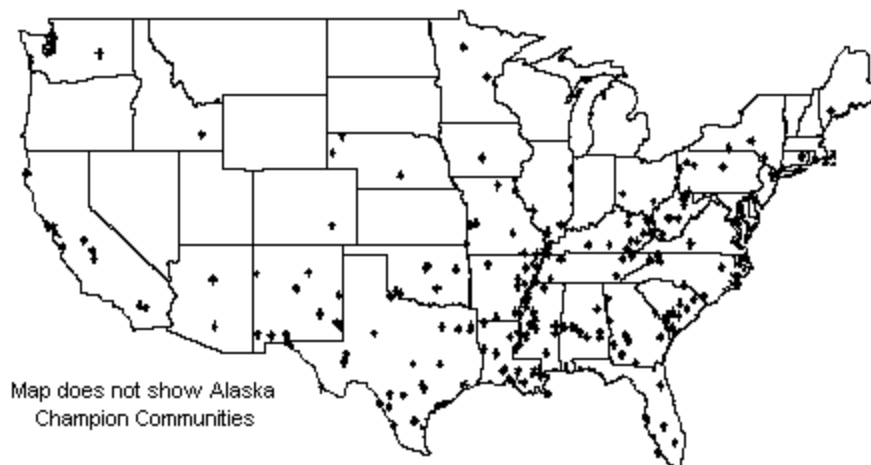
Metlakatla Indian, AK
Four Corners, AZ, NM, UT
Central California, CA
Empowerment Alliance of Southwest Florida, FL
Molokai, HI
Town of Austin, IN
Wichita County, KS
Bowling Green, KY
City of Lewiston, ME
Clare County, MI
Fort Peck Assiniboine and Sioux Tribe, MT
City of Deming, NM
Tri-County Indian Nations, OK
Fayette, PA
Allendale ALIVE, SC
Clinch-Powell, TN
FUTURO, TX
Tri-County Rural, WA
Northwoods Nijjii, WI
Upper Kanawha Valley, WV

Figure 1: Round I Rural EZ/EC Areas



Rural communities that were not given EZ/EC status, but had completed strategic economic development plans, were given “Champion Community” status by USDA’s Office of Rural Development (Round I Champion Communities are shown in Figure 2). Under this program, USDA has funded more than \$100 million in development projects since 1995, coordinated assistance from other agencies, sponsored conferences and networking efforts, and provided targeted technical assistance to these 180 communities.

Figure 2: Rural Champion Communities



USDA has also created two Rural Economic Area Partnership (REAP) Zones in North Dakota.² These areas don’t qualify for EZ/EC status because their poverty levels are not high enough, but instead are isolated, have low-density and declining populations, slowing economic activity, and growing difficulty in providing public services. The REAP zones were created by a Memorandum of Agreement signed by Senator Byron Dorgan, representatives from the two REAP Zones, and USDA Rural Development staff in July 1995.

REAP Zones develop strategic plans and benchmark their progress, just like EZs and ECs. USDA initially pledged \$10 million over 5 years to each of the two Zones, but has since invested over \$29 million to meet critical needs. The Zones have set up a REAP Investment Advisory Committee and a One-Stop Capital Shop in Bismarck, North Dakota, to help with investment activity.

Examples of how EZ/EC funds are being used

The Kentucky Highlands EZ, one of three Round I rural Enterprise Zones, is using its \$40 million in federal funds to promote local businesses and to diversify the agricultural base of the area.³ Specifically, the funds are being used to:

- Allow tobacco growers to try a different crop or farming method at a minimal risk. The Fund offers a no-interest loan of \$2,500 per year that farmers match with cash, labor, or in-kind materials. If the crop does not succeed, the loan becomes a grant.
- Provide venture capital for new businesses. The Venture Capital Fund has obligated \$5.6 million in EZ funds and leveraged almost \$40 million of additional capital, funding businesses ranging from data processing to chicken processing. Funded businesses have created 250 jobs and have commitments for more than 1,200 additional jobs.
- Start 450 home-based businesses, including training for home data entry work and assistance in buying computer equipment.
- Build and equip four rural fire stations within the EZ.
- Expand a county library and increase its telecommunications capacity.

According to a USDA report, rural empowerment zones and enterprise communities created or saved nearly 10,000 jobs between 1995 and 1998.⁴ More than 14,000 people were participating in 61 new job training facilities, and over 25,000 youth were being served by 212 youth development programs. The programs have also built or upgraded 29 health facilities, 130 computer centers and 78 schools.

Federal social service block grants of \$62 million have leveraged over \$615 million in other funds, including \$276 million from federal agencies, \$118 million from state governments and \$170 million from the private sector.

Trends in Rural Economics

The rural economy has made a strong recovery from the crisis of the 1980s, but it has been changed by the experience. Most notably, rural areas are much less dominated by farming than in the past. Today, only 24 percent of all rural employment is in farm and farm-related industries.⁵ Rural economies have been forced to diversify, and have become more similar to economies in urban areas.

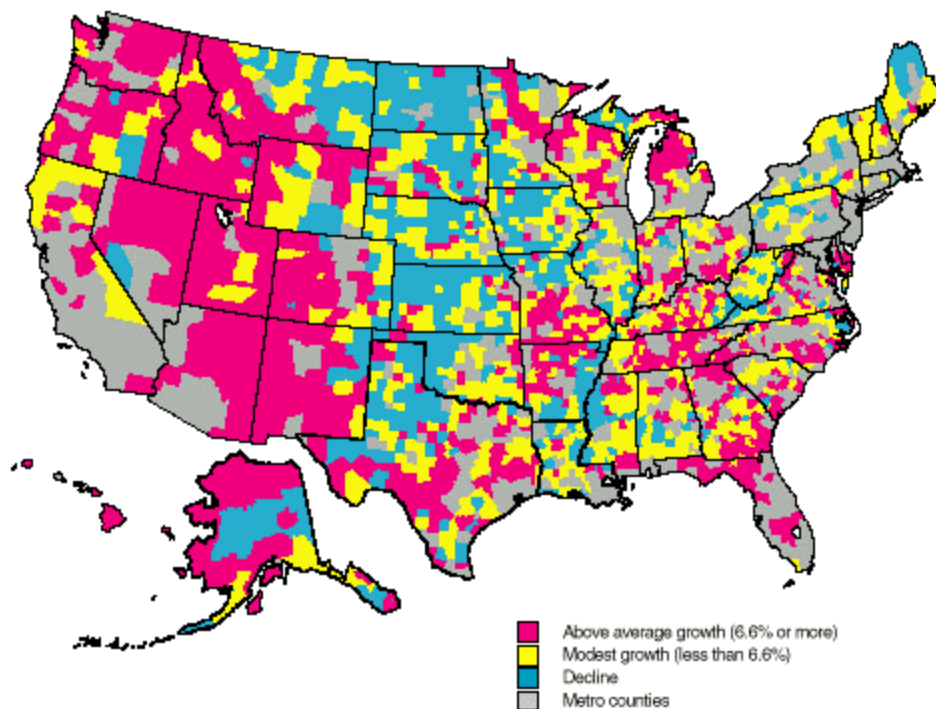
The nature of farming is undergoing a radical transformation too, as economic pressures favor larger farms. If they are not consolidated into larger farms, small farm operations are becoming

part-time sources of income, with small farmers seeking more of their income from non-farm occupations.

After a full blown rural depression in the 1980s, the 1990s have been a period of recovery for many rural areas. Not all economic indicators have improved, but most have.

- Job growth was only 1.3% per year in the 1980s, compared to 2.5% in urban areas. Since then growth has increased to 1.6%, compared to 1.3% in cities.
- The unemployment rate has fallen from 7.2% in 1992 to 5.2% in 1997, the lowest in 23 years. The urban unemployment rate was 4.9% in 1997.
- Real wages in rural areas fell by 12.6% in the 1980s, but have risen by 3.3% in the 1990s. They are still 10% lower than they were in 1979.
- Rural population fell by 2.8% in the 1980s, but has risen in recent years. Most of the rural decline in the 1980s was in the Midwest, which lost a million people; that trend has reversed in the 1990s, with population rising by 310,000.⁶ Still, many areas of the High Plains – the Dakotas, Nebraska and Kansas – continue to lose population (see Figure 3).
- The rural poverty rate has been mostly unchanged, and was 15.9% in 1996. The urban rate has been consistently lower, at 13.2% in 1996.

Figure 3: Rural Population Changes, 1990-97



Source: Calculated by ERS using data from the Bureau of the Census.

Farms are in general more financially stable now than in the mid-1980s, with much less debt (debt to asset ratio was 15% in 1997 compared to 24% in 1985). But a shakeout of less

competitive farms continues. Farming is dominated by large farm operations, with hundreds of thousands of essentially part time farmers contributing much less. The smallest 1.3 million farms, which constitute 63% of the total number of farms but only 5% of the gross income, had a net loss in 1996 averaging \$3400.

Meanwhile, farms with over \$250,000 in sales account for less than 8% of all farms but sell over 65% of the nation's livestock and over 66% of the crops. They have nearly 64% of the gross cash income and more than 78% of net cash income from farming. The largest 22,000 farms alone (about 1.1% of all farms) earned 41% of all net income in 1996.

The total number of farms is shrinking, though the total amount of land used for farming has stayed fairly consistent over the last 20 years. The farm land is being consolidated into larger farm operations.

Small farmers have been busy diversifying their income, mostly by seeking income from non-farm sources. According to USDA, "About 84 percent of the average farm operator's household income comes from off-farm sources, and many operators spent most of their work efforts in occupations other than farming."

Government payments to farmers has declined. Payments in 1996 of \$7.3 billion were the lowest since 1982, and 41 percent lower than in 1993. The "Freedom to Farm" act of 1996 (Federal Agriculture Improvement and Reform Act) is phasing out direct price supports in favor of greater market reliance. According to USDA, the Act will make "farmers freer to alter their crop production in response to relative price signals from the marketplace. Farm income is likely to become more variable under the Act in response to year-to-year changes in the supply and demand for commodities. Marketing alternatives to manage price and production risk are becoming more important for many farmers."

Like individual farms, rural economies as a whole will have to diversify to maintain economic well-being. As USDA notes, "The relocation of new businesses or industries to rural areas can help sustain the economic viability of rural areas as they adjust to changes in agricultural employment."

Trends In Wind Power Development

The wind industry is growing rapidly all over the world, with an annual growth rate of 25.7% in the 1990s.⁷ After a long period of stagnation in the United States, 1073 MW of capacity is going online between June 1998 and June 1999, an investment worth over \$1 billion. This will increase US wind capacity by 50%.

For the first time, most of the wind power expansion in the US is outside of California. As shown in Table 1, Minnesota and Iowa lead the way, but Texas and Wyoming are seeing substantial projects as well.

Most of the wind development is the result of state mandates. In Minnesota, a 1994 settlement over radioactive waste storage by utility Northern States Power resulted in legislation requiring 425 MW of wind and 125 MW of biomass capacity by 2002. A recent ruling by the Minnesota Department of Public Utilities requires an additional 400 MW of wind be added by 2012.

In a 1983 law, the Iowa legislature required 105 average MW of new capacity from renewables. After 15 years of court battles, appeals to the Federal Energy Regulatory Commission and simple delay, the Alternate Energy Production law is being carried out. About 250 MW of wind capacity is going online in 1999, including the largest single wind farm in the world, Enron Wind's 193 MW Storm Lake project.

Table 2: New US Wind Capacity, 1999

	MW
Minnesota	247
Iowa	240
Texas	146
California (new)	117
California (repowering)	181
Wyoming	73
Oregon	25
Wisconsin	23
Colorado	16
Other	5
TOTAL	1073

Source: AWEA.

California is also seeing a great deal of wind construction, but mostly in the form of repowering of existing wind farms. Obsolete wind turbines from the 1980s are being replaced by newer, more efficient machines. After a gradual decline in the early 1990s, overall wind production is expected to rise again. State incentives for new renewable development combined with a nascent market for green power products are driving the activity.

Worldwide wind growth is expected to continue its rapid pace over the next five years. A report by BTM Consult, a Danish wind research firm, projects sales of 22,000 MW over the next five years, with 70% of that growth in Europe.⁸ The US is expected to add 1600 MW between 2000 and 2003, rising to over 4000 MW total.

State utility restructuring laws should have a large effect on renewable energy capacity in the next decade. Renewables portfolio standards adopted in Massachusetts, Connecticut and New Jersey will result in about 1500 MW of new renewables by 2010, while a bill expected to pass the Texas legislature in June would result in 2000 MW of wind by 2009.

III. How Would a Wind Empowerment Zone Work?

A Wind Empowerment Zone would be a way to target economic development in a way that creates specific benefits for wind power. Yet many of the measures that have been used to promote wind power are not unique to wind, such as grants and low-interest loans. Many of the measures used by existing EZ/EC initiatives may be applicable to wind. However, some new approaches may be necessary. In this section we discuss how well current EZ/EC approaches would apply to wind, what policy measures are currently in place to promote wind, and what measures have been most effective.

How Well Would Current EZ Measures Apply To Wind?

Inasmuch as wind power is a conventional business undertaking, many of the measures that are applied to induce economic development in traditional Empowerment Zones and Enterprise Communities would also work for a Wind Empowerment Zone. EZ/EC administrators are using low interest loans, venture capital financing, tax credits, special depreciation allowances, training programs and other measures to promote businesses. All of these would apply to wind power.

One important difference between wind power and conventional businesses is that the market for electricity is very different than the market for most other products. Utility restructuring is “normalizing” markets in some states, opening a market channel directly from generator to consumer. But in most states, utilities still play a prominent role in determining which power products are chosen. Under current rules, most notably the Public Utility Regulatory Policy Act (PURPA), utility payments to independent power producers are set at “avoided cost,” which, due to low coal and natural gas prices and surplus generation capacity in some markets, is too low to make wind power economically viable.

If the utility is using wind to supply “green pricing” programs, where customers agree to pay a higher rate for renewable power, the restriction to avoided cost does not apply. Green pricing is offered by about 50 utilities nationwide, at least 16 of which use wind-generated power.⁹ The wind projects are either owned by the utility or by a third party. Most are small – the largest are an 11 MW wind farm in Wisconsin and 15 MW in Colorado.

Another option for an independent power producer is to supply power directly to wholesale power markets as a “merchant” plant. Since this option has no long-term contracts or guarantees, and wholesale power markets have shown themselves to be highly volatile, high-capital intermittent energy generators like wind are an unattractive option for investors. Most merchant plants have been natural gas generators, characterized by low up-front costs and rapid response to changing market conditions.

In states where markets have been restructured, other options are available. In California, for example, Enron Wind Corp. recently announced construction of a green power merchant plant, a 16.5 MW wind farm near Palm Springs. This power will be used to supply wholesale power to green marketers in California.

As indicated by a recent ruling of the Minnesota Department of Public Utilities, wind power in some instances is not far from being competitive with new natural gas plants, typically the cheapest option.¹⁰ In that ruling, the DPU compared new wind to new natural gas power plants to determine whether an additional 400 MW of wind would be considered “in the public interest.” The cost difference between the two options hinged on projections for natural gas prices. Using projections from the Energy Information Administration, the DPU determined that wind may have a slight cost advantage over the life of the project, and so ruled in favor of the development.

The additional financial incentives used in traditional Empowerment Zones and Enterprise Communities could in some cases provide the extra margin to make wind competitive in the current marketplace. However, additional or different incentives, tailored specifically to wind, may be more effective. Moreover, the amount and type of support will depend on the status of the utility market near that EZ/EC, the wind resource, the presence of green power markets and additional state policies for wind in that region.

What Is Done Now For Wind Power?

The federal government’s most prominent tools to promote wind power are the Production Tax Credit and the Renewable Energy Production Incentive. The PTC is a 1.5¢ per kWh credit for investor-owned utilities and private developers that can be reduced from federal tax payments for the first 10 years of a wind farm’s life. The REPI is a direct payment to public utilities, which are not subject to federal taxes, appropriated by Congress each year.

The LBL study found that the PTC is especially effective for IOUs – due to a “cyclic” tax benefit, the total value is closer to 2.4¢ per kWh. The REPI, however, since it must be appropriated by Congress every year, is difficult to depend on and incorporate into business planning, and is thus worth much less than the PTC. Without the REPI, public utility ownership of wind farms is substantially more expensive than IOU ownership, and only slightly better than by private developers.

On the other hand, a 1997 LBL report finds that the effect of the Production Tax Credit is often less than it appears, especially for private developers.¹¹ The Alternative Minimum Tax, which limits the amount of deductions a business can take, can preclude a developer from taking the full 1.5¢ per kWh deduction, thus limiting the value of the PTC.

The study suggests that the problem could be alleviated by using direct cash subsidies (rather than tax credits), allowing tax credits to be “sold” to other investors or allowing more flexibility on how the deductions can be claimed.

The PTC was slated to expire on June 30, 1999, although a five-year extension has been proposed in Congress.

Wind energy developers also use accelerated depreciation available through the Tax Reform Act of 1986, known as the Modified Accelerated Cost Recovery System (MACRS).¹² Generally, this depreciation allows for a 5-year, double declining balance for wind, solar and geothermal power plants.

In addition, wind developers can generate revenue by selling tradable emissions allowances or credits. The U.S. Environmental Protection Agency (EPA) awards credits to businesses that reduce emissions of sulfur dioxide, which can then be traded to businesses with high emissions. Since wind farms produce no emissions, they can sell credits that need them to comply with the Clean Air Act Amendments of 1990. Each credit is equivalent to 1 ton of sulfur dioxide for 1 year, and currently trades for about \$200.¹³

As part of the Conservation and Renewable Energy Incentives bonus program, EPA has set aside 300,000 allowances to utilities that use energy efficiency and renewables to reduce emissions.¹⁴ A utility earns one allowance for every 500 megawatt hours of energy saved or produced from renewables. A 50 MW wind farm could earn about 265 credits from the bonus program, currently worth \$53,000.

What Incentives are Most Effective in Promoting Wind Power?

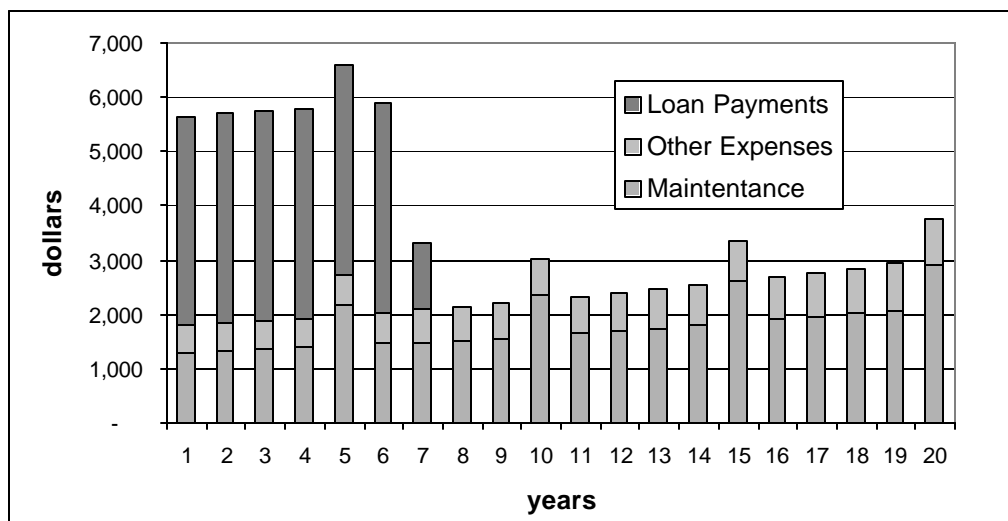
Many of the existing measures used to promote economic development in EZ and EC areas focus on reducing labor costs. Labor is typically a small part of the operating expense of a wind farm, as shown in

Figure 4 and Figure 5. The greatest cost is capital, especially over the first 10 to 15 years of the project when the loan is being paid off. Government policies that reduce financing costs are likely to have a greater effect on promoting wind power.

According to research by the Lawrence Berkeley Lab, specific elements of wind power financing can have a strong effect on the cost of energy.¹⁵ The study compared the type of ownership – private company, investor-owned utility or public utility – on the levelized cost of electricity from a typical 50 MW wind farm. Due to differences in interest rates, amortization, financing requirements and taxes for each type of institution, power from a wind farm owned by a public utility could be as much as 42% less expensive than from one owned by a private developer.

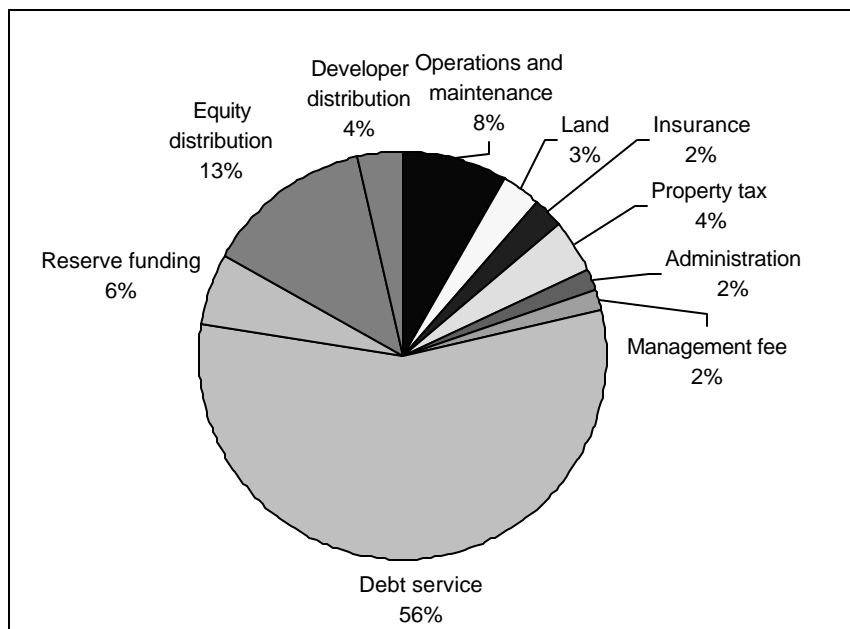
The effect of various cost-saving actions are described in Table 3. In the base case, the study finds that a wind farm owned by a private developer produces power at real levelized cost of 4.3¢ per kWh (or 43 mills), including the effect of the production incentives. The table shows the savings possible with each action, holding all other variables constant. Besides the federal production incentives (PTC and REPI), the key factors in reducing costs were reducing the return on equity, using tax changes to take better advantage of the PTC and altering the cash flow to get more return earlier in the cycle. Almost all of the significant effects focus on reducing the cost of capital, either through directly reducing equity or debt costs, reducing the amount of revenue needed to service debts, or changing tax rules that relate to debt.

Figure 4: Typical Expenses for a Single Wind Turbine



Source: Sustainable Resources Center, "Harvesting the Wind" spreadsheet. Assumes used 65 kW wind turbine, 10 year loan repayment and 20 year turbine life.

Figure 5: Typical First Year Wind Project Expenses



Source: A US wind company.

Often, a private developer will want to maximize the amount of debt to finance a project, thus reducing the need for equity from investors or from the developer's own funds. For a developer, debt financing is typically cheaper (in this study between 5.5 and 9.5%) than equity (upwards of 12%). The greater the debt, however, the greater the risk for the lender. To protect themselves,

lenders require a sufficient ratio of available cash compared to debt repayment (or debt “service”). This debt service coverage ratio (DSCR) ensures the lender that the developer is less likely to default on the loan.

Table 3: Cost Reduction Effects of Various Financial Actions

Action	Savings (mills)
Reduce return on equity from 18% to 12%	9.0
Tax changes to better take advantage of PTC	7.6
Front-load revenues/back-load debt payments	6.5
Reduce debt interest rate from 9.5% to 5.5%	5.0
Extend debt amortization from 12 years to 20 years	5.0
Reduce debt service coverage ratio from 1.4 to 1.0	5.0
Eliminate property taxes	1.7
Shorten depreciation from 7 years to 5 years	1.1

The effect of each action assumes all other variables are held constant, so the savings are not additive. Source: Wisner and Kahn, 1996.

However, it also raises the cost of the project for the developer, by reducing their ability to use low-cost debt to finance a project. Sometimes, a developer will alleviate this problem by “front-loading” a contract, so that the price of the energy decreases over time. In this way, they increase revenue early in the project, improving their DSCR and thus increasing the amount of debt they can use. This approach shifts some of the risk over to the customer however, which is not always possible, and will be even less possible in a competitive market place.

The LBL study recommends a few specific policy measures to reduce finance costs and risks.¹⁶ These and other financial incentives could be used in a Wind Empowerment Zone:

- Loan guarantees – the government would insure loans from private lenders to wind developers, reducing the financial risk and thus reducing the DSCR and interest rates.
- Direct, low cost government loans – the government would supply low-interest or no-interest loans for wind projects.
- Interest rate buy-downs – the government would pay private lenders to reduce their interest rates for loans to wind developers.
- Government-facilitated project aggregation mechanisms – the government coordinates larger wind projects to take advantage of economies of scale.

The report also says that long-term contracts and a more stable US wind market would reduce finance costs by reducing the market risks of wind power. One way federal, state and local governments can create stable contracts for at least a few wind developers is by entering into such contracts for their own power needs. President Clinton’s executive order on “Greening the Government Through Efficient Energy Management” requires federal agencies to consider renewable power in any energy purchases, and allows them to “use savings from energy efficiency projects to pay additional incremental costs of electricity for renewable energy sources.”¹⁷ In California, the City of Santa Monica is now buying all of its power from renewable resources, and an EPA research lab in Richmond recently signed a three-year contract

for renewable power from the Sacramento Municipal Utility District.¹⁸ If longer term contracts were used, that alone may reduce the cost of wind energy in the contract.

In EZ/EC areas with public power, such as rural electric cooperatives, the utility itself can be an agent for economic development, and a partner in wind development. Although few RECs have shown much interest in renewables, there are some exceptions.¹⁹ However, since such utilities serve economically deprived areas, they are probably not in a position to expend extra resources on higher priced power sources, even if it means greater economic health in the long run. They may be able to participate in non-financial ways; the National Rural Electric Cooperative Association (NRECA) serves on USDA's National Rural Development Council. Or, if wind power is made sufficiently economical through financial incentives, rural coops would be a natural market for the power.

Federal power marketing authorities, like WAPA, BPA and TVA also have an explicit charter to encourage rural economic development.

A final way to maximize the economic benefits of wind power development in EZ/EC areas is to promote wind equipment manufacturing in the area, as well as siting of wind turbines. Much of the labor involved in wind power is in the manufacturing stage. In a study of the effects of a 10% Renewables Portfolio Standard in Nebraska, the Union of Concerned Scientists found that 283 net jobs would be produced in Nebraska by 2010 if no equipment manufacturing took place in the state.²⁰ With half of the equipment made in Nebraska, the employment effect increased to 587 net jobs.

This theoretical result is being illustrated in North Dakota, with the LM Glasfiber turbine blade factory. It was sited in Grand Forks in part due to economic development incentives that were available after the Red River flood of 1997.²¹ The factory will employ 130 people when it opens this year, equal to about 20% of the total employment by the North Dakota coal industry.

It may be difficult to site wind manufacturing plants in Empowerment Zones themselves, which are in impoverished or isolated rural areas. Although economic incentives may be attractive to manufacturers, turbine manufacturing requires skilled labor, access to transportation systems and proximity to suppliers and purchasers. The Steele-Griggs EZ, for example, has a population of only 4000 spread across over 800 square miles of land.

Rural EZs may be better suited to offering their natural resources for wind development, and capturing the land-use royalties, property taxes and few maintenance jobs that wind siting creates. Wind equipment manufacturers are likely to be more attracted Enterprise Communities and urban areas, which are less likely to have the wind resources or land availability for significant wind farms.

IV. Where Are Some Likely WEZ Areas?

A Wind Empowerment Zone can be created in one of two ways: add wind power as an economic development project to existing zones in promising windy areas, or create a new kind of EZ specifically for wind development.

Promoting Wind in Existing EZ/EC Areas

A cursory study of existing rural EZs and ECs shows that only a few are in areas known to be windy: the Steele-Griggs County EZ in North Dakota, the Beadle-Spink Dakota EC in South Dakota, and the Oglala Sioux Tribe EZ on the Pine Ridge Reservation in South Dakota. The two North Dakota REAP regions may also be good candidates along with Champion Communities in Nebraska, Texas and Oklahoma. West Virginia and Texas may also provide some opportunities. More research is needed to determine the best areas.

Of the three existing Empowerment Zones, perhaps the most promising for wind power is the Steele-Griggs County Empowerment Zone in North Dakota. The area has suffered a population loss of 27 percent in the last twenty years, and is described as an “agriculture-based economy in long-term distress.”

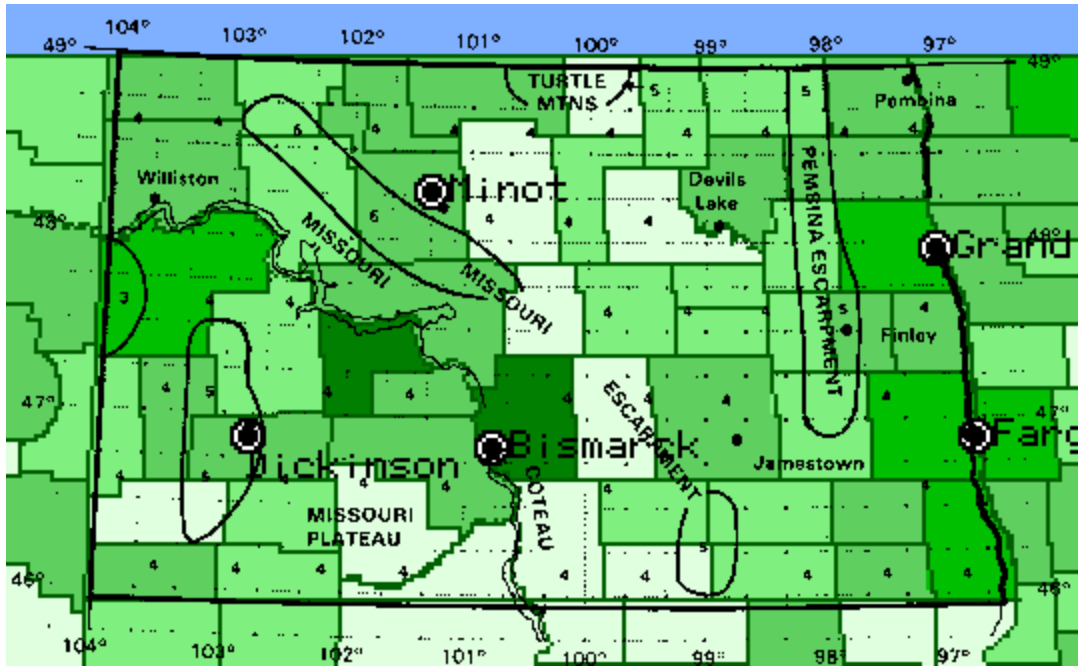
The Steele-Griggs EZ program is especially interested in “diversifying its agricultural-based economy” such as through “developing value-added processing cooperatives with local farmers.” One such operation is a strawboard manufacturing plant, making construction materials from straw grown by local farmers.

The maps here of North and South Dakota show median household income by quintiles, with light colored counties having the lowest income levels. They also show wind speeds by Class, and label major geographic formations. More detailed maps, prepared by the National Renewable Energy Lab, are presented in Figures 8 and 9. These maps show transmission lines and EZ/EC areas.

Wind speeds range from Class 1 through 7, with Class 4 or greater necessary for wind power production. Local conditions can produce viable wind resources that do not appear on these maps. Local resource monitoring is necessary before wind turbines can be sited.

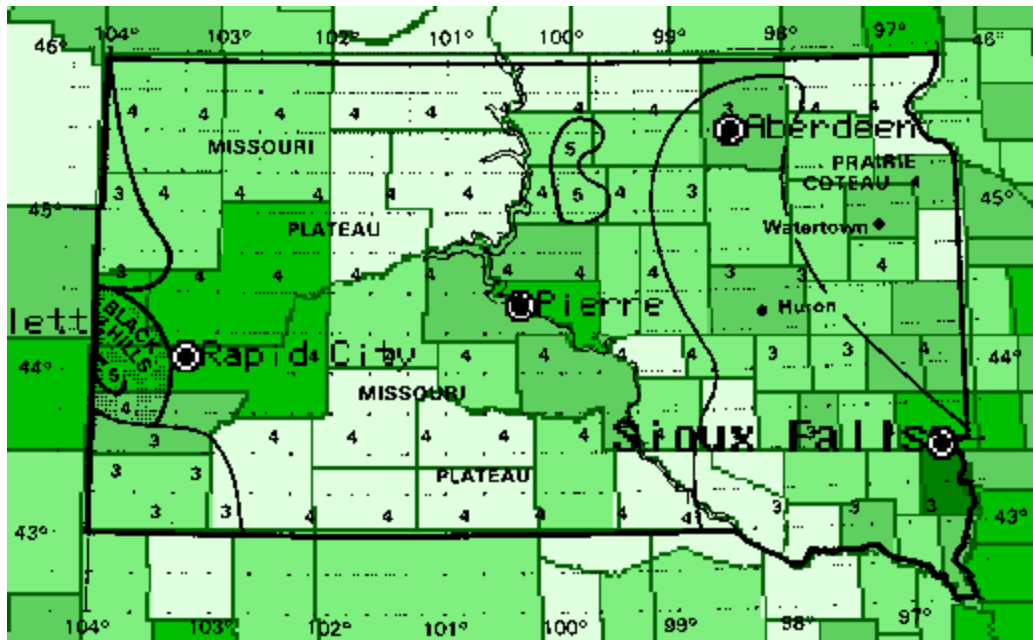
Steele-Griggs is on the eastern edge of the state, between Fargo and Grand Forks. The county seat of Steele County is Finley, shown on the map in Figure 6. Steele-Griggs lies on the Pembina Escarpment, which features mostly Class 4 wind speeds.

Figure 6: Median Household Income (quintiles) and Wind Speeds in North Dakota



Sources: Income – US Census Bureau, TIGER map service, online at tiger.census.gov. Wind speeds – US Department of Energy, National Wind Technology Center, online at www.nrel.gov/nwtc.

Figure 7: Median Household Income (quintiles) and Wind Speeds in South Dakota



Sources: Income – US Census Bureau, TIGER map service, online at tiger.census.gov. Wind speeds – US Department of Energy, National Wind Technology Center, online at www.nrel.gov/nwtc.

Figure 8: North Dakota Wind Resources

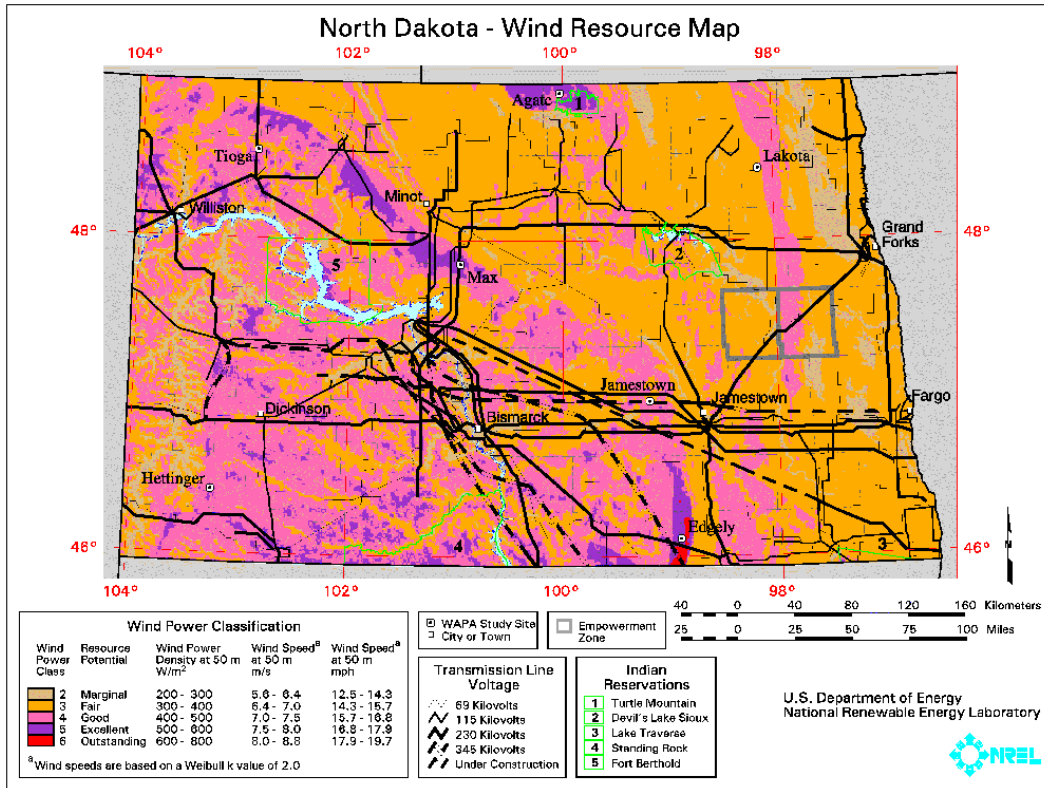
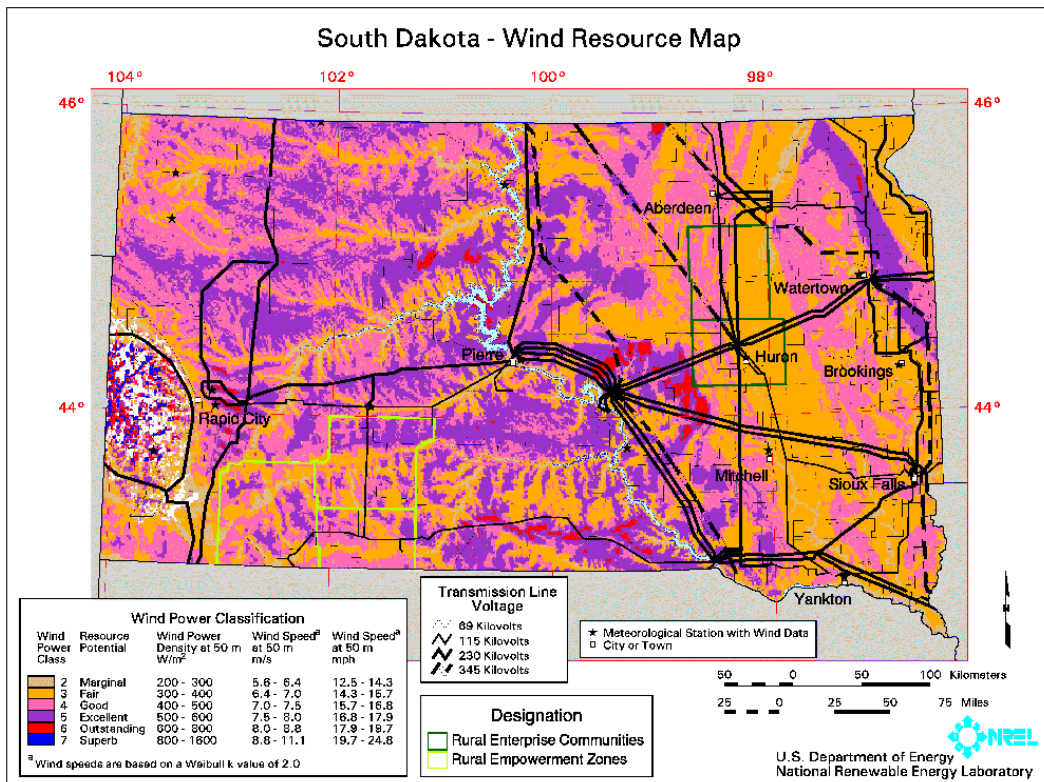


Figure 9: South Dakota Wind Resources



In addition to strong wind resources, Steele-Griggs has a number of factors that make it potentially attractive to wind developers.

First, nearby Grand Forks is the site of a new LM Glasfiber factory, a company that makes blades for wind turbines. The factory is due to open in 1999 and will employ 130 people, making it a significant employer in this city of 49,000.

Second, the municipal utility of Moorhead, Minnesota, installed a single utility-scale (600 kW) wind turbine in 1999 to supply a green pricing program. Moorhead is across the border from Fargo, about 65 miles from Finley.

Third, the Western Area Power Administration (WAPA) owns a high-voltage transmission line that crosses the EZ area. A preliminary assessment of the system indicates there may be sufficient existing transmission capacity to ship power to the Minneapolis area and other load centers to the east.²²

Finally, the EZ is near the service territory of Northern States Power, a Minneapolis-based utility. NSP will be seeking 130 megawatts of wind capacity in the next year to meet a state mandate in Minnesota.

In South Dakota, there are two existing EZ/EC locations that may have good potential for wind development. The first is the Beadle-Spink Dakota Enterprise Community, a Round I EC in Beadle and Spink Counties, the two counties due south of Aberdeen, South Dakota. This EC appears to have some Class 4 winds and substantial access to transmission lines.

The second is the Oglala Sioux Tribe Empowerment Zone, located on the Pine Ridge Indian Reservation in Shannon County, just south of Badlands National Park in southwest South Dakota. This EZ has a poverty rate of 63 percent, an unemployment rate of 73 percent and a school dropout rate of over 70 percent. It was established in Round II of the program in 1998, and is still being organized.

The Oglala Sioux EZ has some strong Class 5 wind resources, but has only limited access to high voltage transmission lines. The reservation is served by four utilities, including Nebraska Public Power District. Part of the Oglala Sioux EZ strategic plan is to establish a tribal utility commission. The tribe recently received a grant from the Administration of Native Americans to develop a utility commission, which is slated to be completed by 2001.

In addition to Empowerment Zone incentives, the tribe has some unique options and issues due to its status as a sovereign nation and a minority community.²³ For instance, tribes have the authority to issue tax-exempt revenue bonds for "essential government functions." Also, tribally owned businesses generally qualify for help from the minority small business program administered by the Small Business Administration. Under the Energy Policy Act of 1992, some federal funds have been used to fund electrification projects, including transmission lines and a wind demonstration project at the Rosebud Sioux reservation in South Dakota. In the Clinton

Administration’s proposal for electric utility restructuring, tribes are given double credits in a renewable energy credit trading system under a portfolio standard.²⁴

Other EZs, ECs and Champion Communities in the United States may also have locally favorable wind conditions, such as in the Appalachian Mountains, Colorado and New Mexico. A more thorough analysis of these areas may be useful.

New Wind Empowerment Zones

The most promising areas for *new* Wind Empowerment Zones would be those with the lowest incomes and highest wind speeds. A listing of the top 15 states for potential wind production is shown in Table 4 and a map of average wind speeds is presented in Figure 10.

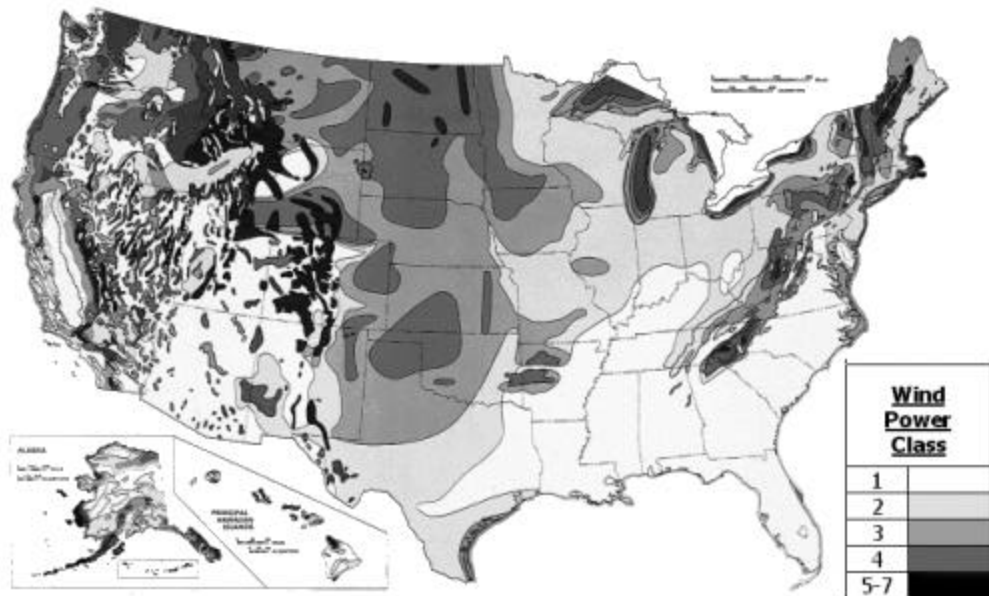
As shown in the maps above, many of the counties in central North Dakota are in the lowest income bracket, and have wind speeds of Class 4. In South Dakota, the poorest counties are on the Missouri Plateau, with wind speeds primarily in Class 4. Much of this area consists of Indian land, such as the Cheyenne River, Standing Rock, Rosebud and Pine Ridge reservations.

Table 4: Top 15 Windy States

Rank		Gross Potential (Billions of kWh)			Gross Potential (Billions of kWh)
1	North Dakota	1,210	9	Minnesota	657
2	Texas	1,190	10	Iowa	551
3	Kansas	1,070	11	Colorado	481
4	South Dakota	1,030	12	New Mexico	435
5	Montana	1,020	13	Idaho	73
6	Nebraska	868	14	Michigan	65
7	Wyoming	747	15	New York	62
8	Oklahoma	725			

Source: AWEA.²⁵

Figure 10: Annual Average Wind Speeds



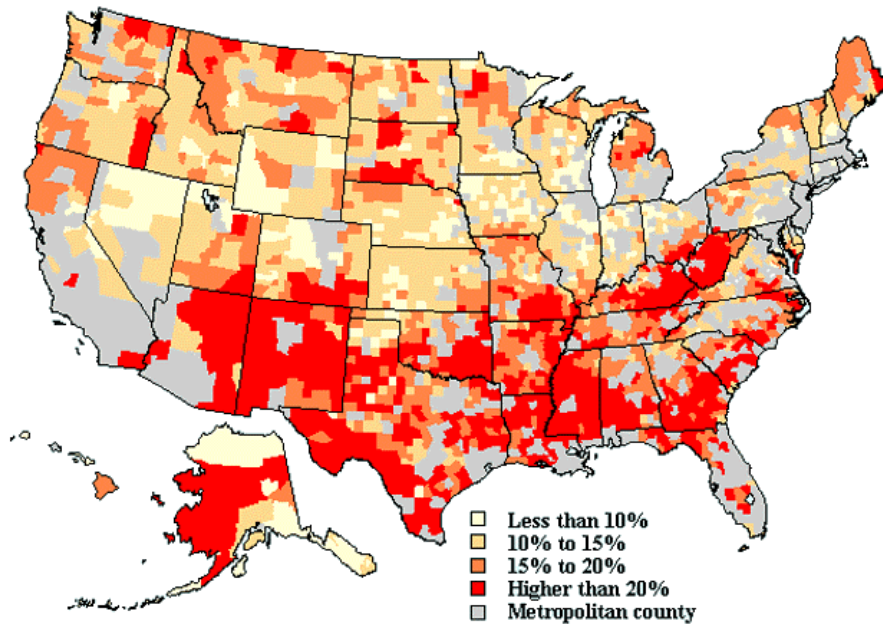
Source: Pacific Northwest National Lab.²⁶

Figure 12 shows the poverty rates of rural counties in 1993, with red areas having rates higher than 20 percent.

Figure 13 shows unemployment rates in 1996, with red areas over 1.5 times higher than the national average. In addition to the North and South Dakota counties noted above, areas of west Texas, New Mexico, eastern Oregon and West Virginia appear to be the most promising in terms of high poverty rates and high wind resources.

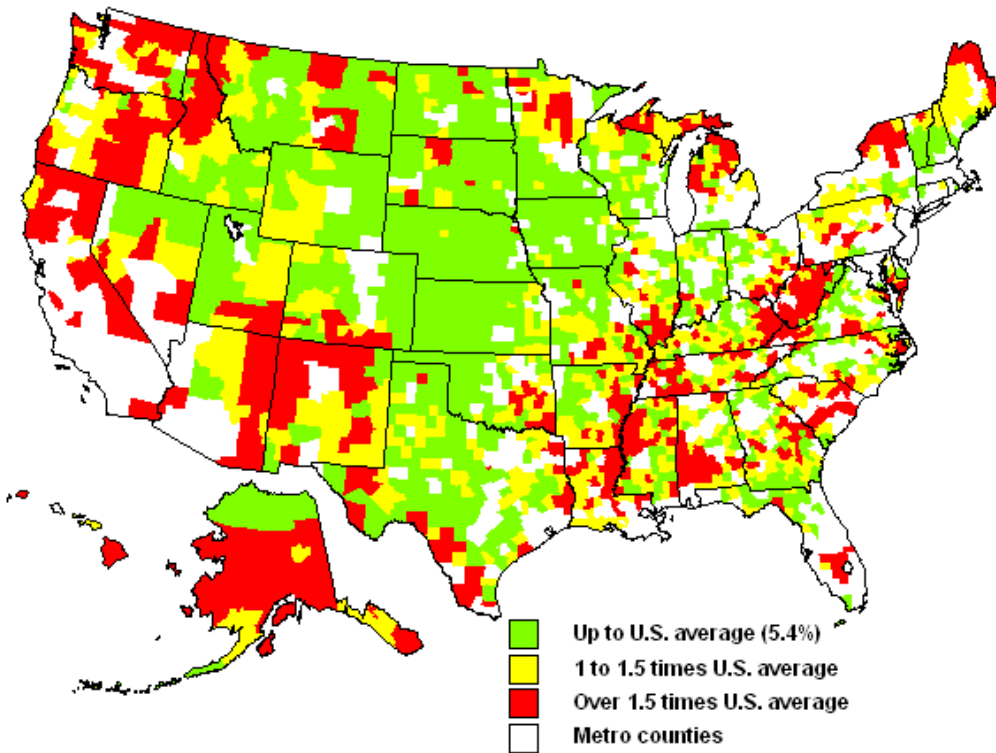
A more thorough analysis, using GIS to compare economic variables with wind speeds and transmission lines, would be able to better identify locations for new WEZs.

Figure 12: Rural Poverty Rate, 1993



Source: Economic Research Service, USDA.²⁷

Figure 13: Rural Unemployment, 1996



Source: Economic Research Service, USDA.

V. Strategies to Create WEZs

Incorporate into Existing EZ Programs

Wind power projects could be incorporated into existing EZ programs, especially Round II communities. The North Dakota EZ, a Round I area, has a two year planning cycle for new proposals. Although their initial projects have already been established, the program will be able to add or drop programs every two years.

Round II communities were announced in December 1998. Although they have already formulated strategic plans as part of the application process, these plans may still be open to modification. Either way, many plans include generic measures to promote economic development, such as venture capital loans, that could be applied to wind.

Include Wind EZs in Round III

Given the substantial number of communities that applied for EZ/EC status in both Round I and Round II, there is some support for another round of applications. Rep. Charles Rangel (D-NY) announced in February that he would “soon introduce legislation to provide grant funding for the 20 new empowerment zones.”²⁸ A wind empowerment zone provision could be included in Round III, if there is one, possibly in a Gore Administration.

Create Separately from the EZ Initiative

There are many rural economic development programs that occur outside of the EZ/EC program. The North Dakota REAP zones, as mentioned above, were created because those distressed areas did not qualify for EZ status. A significant effort of the EZ/EC program is simply to coordinate the many federal programs that are already available. If there is no Round III of the EZ/EC program, a Wind EZ could be introduced on its own.

Get Agencies and NGOs to Participate in the EZ Initiative as a Partner

Many federal agencies participate in the EZ/EC initiative through supplemental or complementary programs of their own. EPA, for example, gives all EZ and EC designees and applicants automatic priority for the agency’s Brownfields Economic Redevelopment Pilot grant awards to revitalize abandoned contaminated properties, and gives technical assistance to EZ/EC communities applying for Brownfields funds.

DOE and public power authorities (such as TVA) are so far not involved in the EZ/EC initiative. DOE supports specific wind power development projects through the Turbine Verification Program, a joint undertaking with the Electric Power Research Institute, and performs a great deal of research on wind power. DOE recently announced a broad initiative to promote wind power, called Wind Powering America, with a goal of producing 5 percent of US power from wind by 2020.

Among non-governmental organizations, the National Center for Appropriate Technology (NCAT) and the National Rural Electric Cooperative Association (NRECA) are partners with USDA on the rural EZ/EC initiative.

Should biomass be included?

Studies by the Union of Concerned Scientists, Skip Laitner, the Iowa Department of Natural Resources and others have shown that biomass energy is generally more labor-intensive than wind energy.²⁹ Since the EZ/EC program puts a strong emphasis on job creation, such as through payroll tax incentives, biomass energy may be well suited to the rural EZ program.

Moreover, not all or perhaps even many EZs and ECs are in areas with a sufficient wind resource. Biomass crop production potential, on the other hand, is less a result of natural resources than of land prices.³⁰ Economically depressed areas may have sufficiently low land prices to enable biomass crops to be more competitive with coal.

On the other hand, since biomass power from energy crops is generally more expensive than wind, the economic obstacles will be more difficult to overcome. The EZ/EC program is interested in promoting long lasting economic gains in these areas, by launching businesses that have a good chance of being self-sustaining after support ends.

VI. Contacts

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