

The Costs and Benefits of Closing Prairie Island

David Morris and John Bailey

November 1993

INSTITUTE FOR LOCAL SELF-RELIANCE

Environmentally Sound Economic Development

The Institute for Local Self-Reliance (ILSR) is a nonprofit research and educational organization that provides technical assistance and information on environmentally sound economic development strategies. Since 1974, ILSR has worked with citizen groups, governments and private businesses in developing policies that extract the maximum value from local resources.

Institute for Local Self-Reliance

1313 5th Street SE, Suite 306
Minneapolis, MN 55414
Phone: (612) 379-3815
Fax: (612) 379-3920

2425 18th Street NW
Washington, DC 20009
Phone: (202) 232-4108
Fax: (202) 332-0463

The Costs and Benefits of Closing Prairie Island

by David Morris and John Bailey

Energy Policy at the Crossroads

On June 8, 1993 the Minnesota Court of Appeals ruled that the Minnesota legislature has the authority to authorize an Independent Spent Fuel Storage Installation (ISFSI) at Prairie Island.¹ The Court reasoned that since the facility might well become permanent the legislature has sole jurisdiction to make such an historic decision.

The decision about an independent radioactive waste storage facility may be the single most important energy-related decision the legislature makes in the 1990s. If the legislature refuses to grant permission to build such a facility the two nuclear reactors at Prairie Island will have to be shut down. Shutting down these reactors results in both costs and benefits. The economic cost is the increased price of electricity. The economic benefit includes the jobs and businesses generated by creating a homegrown, renewable fueled electric generation capacity. The psychological benefit to Minnesotans is knowing that they have dramatically reduced our generation of a waste product for which there is no known guarantee for safe storage.

It is unfortunate that the legislature is being forced to make an up or down decision at the last minute. For the process concerning Prairie Island began four years ago. In December 1989 NSP initiated its Environmental Impact Statement process for the independent waste storage facility. In April 1991 NSP filed an application for a Certificate of Need for the facility. In late 1991 an Administrative Law Judge held evidentiary hearings on the proposed facility and in the spring of 1992 he recommended denying a permit unless

expressly authorized by the legislature.

It is important to note that NSP requested authorization to store up to 48 dry casks at the independent storage facility. This would have given it sufficient space to store the spent fuel from the reactors until the year 2014, the end of the reactors' current operating license. The PUC, on August 10, 1992, overruled the Administrative Law Judge and gave NSP permission to build an ISFSI but only to store 17 dry casks, enough to last until the year 2001.² In its order, the PUC concluded that after the year 2001 "it is unclear what the most prudent, cost-effective option will be".

To its credit, as part of its order the PUC for the first time required NSP to undertake a serious examination of alternatives. "As part of its next biennial resource planning process, the Company shall conduct detailed analyses of the feasibility and cost of different strategies for replacing Prairie Island generation, should the need arise."³ Since 1989, when NSP developed its first environmental impact statement on the dry cask storage facility neither the utility nor the Minnesota Department of Public Service have seriously examined the alternatives to Prairie Island.

On July 30, 1993, one year after the PUC order, NSP submitted its next resource plan. The plan is more than 400 pages long. Only seven paragraphs are devoted to addressing alternatives to Prairie Island.⁴ No feasibility analysis is included. No cost studies of different strategies are included.⁵

Minnesota now stands at an energy crossroads. The Prairie Island issue presents the legislature with the opportunity to make a fundamental decision about Minnesota's energy future. The legislature has repeatedly declared itself in favor of pursuing an energy policy that aggressively favors energy efficiency, in-state renewable energy and cogeneration. Back in 1980 the legislature declared, "the state has a vital interest in providing for...the development and use of renewable energy sources wherever possible".⁶ As recently as last year the legislature told the Public Utilities Commission that it "cannot approve a new or refurbished nonrenewable energy facility in an integrated resource plan or a certificate of need...unless the utility has demonstrated that a renewable energy facility is not in the public interest." The same law requires that "As part of its resource plan filing, a utility shall include the least cost plan for meeting 50 and 75 percent of all new refurbished capacity needs through a combination of conservation and renewable energy resources."⁷

Northern States Power's most recent 15 year resource plan projects an increase in energy demand of 2.2-3.2 percent per year. Energy efficiency measures are expected to only modestly reduce the projected energy demand. Even more ominous, NSP projects an energy increase 50 percent larger than the entire energy output of Prairie Island, yet the utility plans on meeting only 2 percent of the projected increase with in-state renewable energy.⁸

The Prairie Island issue gives the legislature the opportunity to insist that NSP and other Minnesota utilities aggressively pursue energy efficiency and renewable energy and high efficiency gas fired cogeneration programs. It is important to remember that the PUC gave permission only for sufficient storage space for Prairie Island's two reactors to operate till the year 2001. Even if the legislature were to uphold the PUC decision it must put in place a policy that would

maximize efficiency and the use of renewable energy and gas fired cogeneration such that we are not in this same situation in the year 2000.

After studying the data and what is occurring in other parts of the country, our conclusion is that abundant power is available to replace Prairie Island both in the short and the long run. The cost of doing so would be about equal to an average year's rate increase. Let me repeat this. We can shut down Prairie Island and aggressively build an in-state energy efficiency and renewable energy industry for the cost of a typical annual rate increase.

Studies have consistently shown that Minnesota is capable of generating all or a great majority of its electricity using renewable fuels. Minnesota spends almost \$7 billion on energy every year. Half of that pays for imported fuels. By rechanneling that expenditure to businesses inside the state, tens of thousands of new jobs and hundreds of millions of dollars in new tax revenues can be generated. Therefore an aggressive effort to create a viable renewable energy industry in Minnesota is not only a strategy for eliminating the need to become host to a permanent outdoor radioactive waste facility but also a strategy for reducing many kinds of pollution within the state and promoting a healthy state economy.

The short term rate increase will come to less than 4 percent. Minnesotans and Americans in general have expressed their willingness to pay slightly more for energy if that means they will not be home to a radioactive waste dump, if they can increasingly rely on renewable fuels and if they can become increasingly independent of imported energy. In Sacramento, households are given the opportunity to pay 15 percent higher rates in return for having the utility install a photovoltaic system on their rooftops. The program is oversubscribed.

The objective of state policy should be to minimize the short term cost of closing down Prairie Island and to maximize the long term economic benefit to the state of fostering

a new renewable fueled electric industry that relies on in-state fuels and businesses.

Making the Transition

Northern States Power has owned and operated the Prairie Island twin nuclear reactors since 1973. Each unit has a capacity of 530 MW. In 1992 the plants generated 6,712,686,000 kWh of electricity, about 20 percent of NSP's total system generation and 15 percent of total Minnesota electric consumption.⁹

Delaying Shutdown

In its Certificate of Need filing, NSP identified several ways that existing storage pools could be modified to allow for more spent fuel to be stored. This option is known as reracking. This means rearranging the spent fuel, using reconfigured storage racks to expand available space. NSP has re-racked its storage pool twice already, in 1977 and again in 1981.

Re-racking requires no modification to the pool's support structure. According to NSP, design, fabrication and installation could be completed in a two year time frame.¹⁰ This would give the pool 20 percent more space, allowing both reactors to operate until 1999. Reracking might be accomplished at no additional cost.¹¹

Reracking is a useful option because it allows several years for NSP to find the lowest cost purchased and replacement power and to allow for the creation of a significant renewable fueled capacity to be built. Because of the delays in seriously considering alternatives to Prairie Island NSP may be forced to pay a premium price for purchased power. It requires 2-3 years for new small

scale cogeneration or wind power plants to be built.

Importing Power

Utilities routinely buy and sell power to one another. NSP, for example, has just agreed to sell 90 MW of power annually to Michigan's Upper Peninsula Power Company beginning in 1998.¹² NSP thus believes it will have at least that much excess power capacity beginning in that year.

NSP has a firm contract to buy 500 MW annually from Manitoba Hydro. Manitoba Hydro is expecting relatively stable demand in the future. According to Manitoba Hydro, a maximum of 1650 MW could be dispatched to the metro area and NSP has room to purchase an additional 500 MW of power.¹³ NSP is charged 2-3 cents per kWh for its power purchases from Manitoba on a long term contract. This is competitive with Prairie Island's cost of power.

Power may also be available from inside of Minnesota. The recent closing of the National Steel Pellet Co. plant at Keewatin, MN may allow Minnesota Power to sell more than 200 MW to NSP.

The Department of Public Service estimates the cost of buying power at about 3 cents per kWh and \$65 per kW. This is equivalent to about 4 cents per kWh.¹⁴

Increasing Production from Existing Plants

NSP could increase production from existing power plants, some of which have very low capacity factors. The incremental costs of increasing production from coal fired power plants is low, probably in the 1-2 cents per kWh range. Increasing the amount of coal burned in Minnesota, even for just a few years, would still present environmental problems. However, wood rather than coal could be the fuel of choice when expanding production from existing plants.

NSP currently co-fires about 25,000 tons of waste wood(sawdust) annually with coal at the King power plant. The cost of retrofitting a plant to co-fire wood is typically \$100-200 per kW of equivalent wood fired capacity. Wood co-firing rates of "10% to 20% heat input from wood appear achievable" according to NSP.¹⁵ Thus in many plants electric production could be increased by 20% by relying only on wood as the additional fuel. Sufficient wood waste may be available to expand production from primarily coal-fired power plants by more than 100 MW.

Building Natural Gas Fired Cogeneration

The most abundant short term power option is natural gas fired power plants. The most efficient of these plants capture a significant amount of heat normally wasted by conventional power plants. These are called cogeneration plants. Some industries generate a substantial amount of waste heat in their manufacturing process. They could install a turbine and generator and produce electricity from this otherwise wasted resource.

NSP does not encourage cogeneration in its service area. Indeed, when several industries have considered installing cogenerators to take advantage of their waste steam, NSP has dissuaded them by offering discounted rates. This occurred most recently when Rahr Malting wanted to install a 4.5 MW

cogeneration plant.

Gas fired cogeneration plants are highly reliable. Across the country these plants are now viewed as both a short term and long term alternative to nuclear power and coal. Based on the recent experience in other parts of the country, independent power producers could build sufficient power to displace Prairie Island by 1996 at costs of 3-3.5 cents per kWh.

Vancouver, Washington's Clark Public Utilities recently solicited bids to replace 150 MW of power it currently purchases from the Bonneville Power Administration (BPA). Clark received over 30 proposals from utilities and independent developers offering to supply 4,080 MW, almost four times the size of Prairie Island's reactors.¹⁶ These proposals were competitive with BPA rates that are about 3 cents per kWh.

In October Clark chose three finalists. The lowest had a 20 year levelized cost of electricity of 2.72 cents per kWh. The highest had a cost of 3.39 cents per kWh. The combined proposed capacity of the four finalists is 571 MW, more than enough to displace one of Prairie Island's reactors.¹⁷

The Sacramento Municipal Utility District(SMUD) closed down its Rancho Seco nuclear plant after a public referendum and immediately undertook a very aggressive conservation and energy replacement program. It expects to bring on-line 518 MW of cogeneration by 1997. The average levelized costs for all four projects is 3-3.3 cents per kWh.¹⁸

The only way to accurately estimate the cost of replacement power is to issue a request for proposal. This would spur private developers to identify, for example, those Minnesota industries where their internal heat loads or waste steam generation capacity is most nearly matched to cogeneration facilities. Earlier this year the Wisconsin Public Service Commission issued its own Request for Bids.

This was highly unusual. Usually utilities, not regulatory commissions, issue such solicitations. Wisconsin received at least 9 proposals offering nearly 2000 MW of power.¹⁹ The Minnesota Public Utilities Commission should imitate the Wisconsin PSC to ascertain the cost of alternatives.

Expanding Renewable Energy

The closure of Prairie Island offers Minnesota the opportunity to jump start an in-state renewable energy industry. Such a strategy would comply with repeated legislative directives.

The largest near term renewable fuel for generating electricity in Minnesota is wind. Minnesota was one of the first states to complete a detailed assessment of its wind capacity. The windiest areas of Minnesota lie in its southwestern corner around the Buffalo Ridge. Wind speeds in that region average over 13.5 miles per hour and could generate 200 million MWh of electrical energy annually.²⁰ This is more than 30 times more electricity than is generated by Prairie Island.

How quickly can wind power be scaled up in Minnesota? The experience in California is instructive. In six years, from 1981 to 1987, California expanded its windpower capacity by almost 1,500 MW. And that occurred when the wind industry was still in its infancy. In its peak years, California companies were installing over 400 MW of wind capacity a year.²¹

Minnesota currently has about 1 MW of installed wind capacity. It is likely that Minnesota could achieve an annual installed incremental capacity of 400 MW by 1997. Additional transmission line capacity would have to be built. This can also occur within that time frame.

An aggressive effort could allow

Minnesota to have an installed wind electric capacity of about 2,000 MW by the year 2000. Such generation would require the installation of 6,000-7,000 wind turbines. The electrical generation from these turbines would be equivalent to about 5,300 GWh per year, some 80 percent of Prairie Island's output.

Electricity generated from wind would be more expensive than imported electricity or cogeneration, at least in its initial stages. In mid 1993 NSP contracted to purchase 25 MW of wind for about 5 cents per kWh. By the year 2000, this cost could drop to 4 cents.

When comparing the cost of renewable fuels to conventionally fueled power plants we should note that the 1993 legislature required the Public Utilities Commission to quantify the environmental costs of various types of electrical generation by the end of February 1994.²² Based on the experience of other states that have already quantified these externalities, even if the PUC were to choose a lower end estimate it would make renewable electric plants highly competitive with conventional power plants.

Wind is the single largest near term renewable energy alternative to Prairie Island. But it is not the only one. Minnesota also boasts an abundant supply of agricultural land capable of growing sufficient plant matter to meet a significant portion of its electrical needs. Plant matter can include existing wood waste and trees, fast growing trees like hybrid poplars, annual high fiber crops like sweet sorghum from which ethanol could also be produced in the same energy-producing process, and perennial crops like switchgrass or other native grasses.

Economic Development

An aggressive program to install wind turbines or plant matter fueled power plants in Minnesota would yield several important economic benefits.

First, it would create jobs. Two thousand megawatts of wind power would generate 600 full time jobs in manufacturing and erecting the wind turbines. The ongoing operation and maintenance of the wind turbines would employ at least an equal number of people and perhaps as many as 1,500 people.²³ Such an industry would employ more people than are currently employed at Prairie Island. This direct employment would generate even more indirect employment in service and retail industries. If land rent is paid this too would increase the amount of money circulating in the local economy.²⁴

Wind turbines create manufacturing and maintenance jobs but since the fuel is free they do not create jobs in supply the fuel. Plant matter fueled plants, whether the plant be switchgrass that is burned directly or turned into a gas, or fast growing trees that are burned as solid fuels, or a crop like sweet sorghum where the cellulosic portion would be burned and the sugars could be converted into a liquid fuel like ethanol, would generate a very significant number of jobs for those who would grow, harvest and in some instances process the crops.

Economic development comes not only from the job creation derived from building the plants but from the knowledge created in doing so. If Minnesota were to become a center for wind turbine design, production, and installation it would nurture homegrown engineering, software and manufacturing expertise that might itself become a major new

export oriented industry.

Promoting Energy Efficiency

A key factor in planning the capacity needed to displace Prairie Island is the rate of growth of electrical demand in the future. Without an aggressive energy efficiency effort the growth in electrical consumption over the next ten years could be equivalent to the electricity generated by Prairie Island. NSP's July 1993 resource plan projects system energy consumption rising by 5,058 GWh by the year 2000 and by 9,313 GWh by the year 2005. This compares with 6,712 GWh generated by Prairie Island's reactors in 1992.²⁵

NSP's energy efficiency efforts are projected to reduce the projected annual energy growth rate by only 20 percent, from 2.5 percent to 2.0 percent. This modest 20 percent reduction should be compared to the efforts of several other utilities that are planning to reduce projected growth by as much as 60 percent.²⁶ Indeed, the Sacramento Municipal Utility District's (SMUD) aggressive energy conservation program expects not only to eliminate any load growth but to actually reduce overall energy consumption below 1993 levels by the year 2000.²⁷ If NSP were to achieve these more aggressive efficiency improvements it could save almost the energy equivalent of Prairie Island by the year 2005.²⁸

The Cost of Conversion

How much will the price of electricity to Minnesotans rise if we close down Prairie Island's reactors?

One element in this equation is the current and projected cost of power from

Prairie Island.

NSP claims the operation and maintenance costs at Prairie Island are 1.5 cents per kWh. National 1990-1992 O&M costs for plants with similar fuel cycles are about 2.3

cents per kWh.²⁹ NSP CEO Jim Howard has been quoted as saying that operating and maintenance costs of nuclear plants are going up rapidly. If the real costs of O&M were to increase by 2.5 percent per year, by the year 2002, in 1993 dollars, Prairie Island would cost 1.92 cent per kWh.³⁰

There is some suggestion that the capital costs of Prairie Island may be rising. The *Star Tribune* wonders if the plant is "getting old before its time".³¹ NSP is suing Westinghouse because of what NSP says are steam generators whose tubes are wearing out, thinning and cracking. NSP is suing Westinghouse for the cost of repair plus the cost of unexpectedly lengthy plant shutdowns and the purchase of replacement power. The total cost of the faulty steam generators, according to NSP vice president and general counsel Gary Johnson could be \$500 million.³²

If ratepayers were required to pay this additional capital cost the price of electricity from Prairie Island would rise by .5-.9 cents per kWh.

The true cost of electricity from Prairie Island may be as low as 1.6 cents³³ per kWh and as high as 3.0 cents per kWh. This excludes any environmental costs.³⁴

The cost of replacement power for Prairie Island would be between 2.7-4.0 cents per kWh, with the greatest probability being in the 3.0-3.3 cents per kWh range. Therefore, in the worst case scenario, assuming the lowest estimated cost of the electricity from Prairie Island and the highest cost of replacement power, rates would rise by about \$165 million a year. Under the best case scenario, assuming the highest estimated cost of electricity from Prairie Island and the lowest cost of replacement power, rates would not rise at all.

Without an intensive and extensive investigation, something that should have been completed years ago, no one can

accurately predict what the cost will be. Our best guess is that the difference in the cost of Prairie Island and that of replacement and purchased power would be about 1-1.5 cents per kWh.

Another element in the equation is that 70 percent of NSP's sales are in Minnesota. Therefore Minnesotans will be responsible for paying 70 percent of the additional cost. Assuming an additional price of 1.5 cents per kWh, Minnesotans would see a \$75 million rate increase, a rise of about 4 percent. This corresponds to about \$1.50 per month for the average residential customer.

The bottom line is that we could shut down Prairie Island's two nuclear reactors for a cost equivalent to one year's rate increase.

**NSP's Rate Cases 1985-1993
(million \$)**

Year	NSP request	PUC approved	% increase
1986	\$128.9	\$36.9	3.85%
1988	99.3	73.2	7.00%
1990	120.7	denied	0.00%
1991	98.2	55.5	4.57%
1993	119.0	72.4	5.47%

Electricity from renewable energy sources would be more expensive than gas fired cogeneration plants, at least in the short run. Yet these types of plants, as noted above, can produce the greatest employment and economic development benefit to Minnesota. The additional short term cost of relying on renewable fuels should be viewed as an economic development investment whose return will come in the creation of jobs, increased taxes and a more self-reliant and diversified state economy.

In the future we may look back on the coming decision regarding Prairie Island as the turning point in Minnesota energy policy, a moment when we translated the lofty goals of energy self-reliance and in-state job creation

and environmental protection into actions | commensurate with the opportunity. |

NOTES

¹ In July, 1993 the Minnesota Supreme Court refused to review the Appeals Court decision. Minnesota Supreme Court, NW Reporter cit. 501-NW 2nd 638, July 15, 1993(Minn APP 1993, CI-92-2314, review denied) *In the Matter of an Application for a Certificate of Need for Construction of an Independent Spent Fuel Storage Installation* . Docket No. E-002/CN-91-19.

² *In the Matter of an Application for a Certificate of Need for Construction of an Independent Spent Fuel Storage Installation*. Docket No. E-002/CN-91-19. August 10, 1992. Minnesota Public Utilities Commission. Saint Paul. NSP proceeded to construct a storage facility with the capacity of storing the full 48 casks even while the courts were reviewing the PUC decision.

³ *Ibid.*

⁴ *Application for Resource Plan Approval 1994-2008*. July 30, 1993. Docket Number E-002/RP-93-630. Northern States Power.

⁵ The refusal of NSP to comply even with a direct PUC order must engender skepticism among those who read its current three quarter page ads on Prairie Island that insist, “at NSP, we also believe it’s important to deliver solid information, because good decisions come from an informed public.”*Star Tribune*. October 12, 1993. p. 8A.

⁶ Laws of Minnesota. Ch. 579. 1980.

⁷ Chapter 216B.2422.

⁸ Northern States Power. *Application for Resource Plan Approval 1994-2008*. Docket Number: E-002-RP-93-630. Volume 2. Appendix A. July 1993.

⁹ The percentage of NSP system includes sales to Wisconsin and North Dakota. Minnesota comprises about 70 percent of NSP’s total system sales. If we apply this factor to Prairie Island then its electrical output represents about 10 percent of Minnesota’s electric consumption.

¹⁰ *Application for Certificate of Need for Prairie Island Spent Fuel Storage*. Docket No. E002/CN-91-19. Northern States Power before the MN Public Utilities Commission. June 1991. Supplemental Information.

¹¹ The capital cost of reracking is \$8-10 million, with low level radioactive waste removal costing \$2 million. *Application for Certificate of Need for Prairie Island Spent Fuel Storage*. Docket No. E002/CN-91-19. Northern States Power before the MN Public Utilities Commission. April 1991, Vol 1. Through the end of 1990 NSP had accumulated approximately \$17.7 million in an internal reserve to provide for interim storage of spent nuclear fuel. About \$3.5 million is added to this fund each year. This fund could be used to expand the storage capacity of the pool. See David Jacobson, Mike Michaud, Bret Eknes, *Whether the ISFSI facility proposed by NSP should be certified for construction in the State of Minnesota*, Docket E-002/CN 91-19. June 26, 1992.

¹² *Star Tribune*. October 9, 1993. p. 3D.

¹³ Conversation with Jerry Rhult, Manitoba Hydro. October 7, 1993.

¹⁴ DPS response to ILSR Informations Request No. 1 in NSP’s *Application for Resource Plan Approval, 1994-2008*(PUC Docket E002/RP-93-630).

-
- ¹⁵ *Application for Resource Plan Approval. 1994-2008.* July 30, 1993. Volume 2. p. B-6
- ¹⁶ *Independent Power Report.* July 30, 1993, p. 3.
- ¹⁷ *Electric Utility Week,* October 18, 1993.
- ¹⁸ *Independent Power Report.* October 22, 1993.
- ¹⁹ *Electric Utility Week.* July 5, 1993, p. 15.
- ²⁰ John R. Dunlop and Paul Helgeson, *Wind Resource Assessment Program.* WRAP Report Number 10. Minnesota Department of Public Service. Saint Paul. Minnesota. 1990.
- ²¹ Conversation with Randall Swisher, Executive Director, American Wind Energy Association. Washington, D.C. October 14, 1993.
- ²² Laws of Minnesota 1993, Chapter 356, Section 3.
- ²³ The lower figure is from *Wind Energy Weekly,* June 7, 1993 based on the California experience. The higher number is from John R. Oughton and Bruce A. Drew, *Minnesota Energy Futures: A Plan for Employment, Economic Development and the Environment.* Draft. 1993.
- ²⁴ As a minor example, farmers would be paid a land rent by developers who install wind turbines on their land. The wind turbine takes up only about 5 percent of the land surface, allowing farming to continue to take place. Based on the California experience, land rent may be about \$40 per acre. For an installed capacity of 2,000 MW, Minnesota farmers and other land owners would be paid several hundred thousand dollars a year a year in land rent.
- ²⁵ *Application for Resource Plan Approval. 1994-2008.* Northern States Power. July 30, 1993. F-105. Vol. 2.
- ²⁶ According to our reading of its resource plan, NSP chose to minimize rather than maximize energy savings even though its own calculations indicated higher net savings by achieving higher savings goals. See *Application for Resource Plan Approval. 1994-2008.* July 30, 1993. Volume 1. See section IV, pp. IV-4-6 and Table on VIII-2.
- ²⁷ Presentation by SMUD board member, Edward Smeloff, to the Minnesota Public Utilities Commission on November 12, 1993.
- ²⁸ 5,179 GWh. It may be instructive to review the findings of Administrative Law Judge(ALJ) Allan Klein, who reviewed the testimony of witnesses on alternatives to Prairie Island and issued his decision in mid 1992. The ALJ is an independent party. Among Klein's conclusions: NSP could achieve 5400 GWh of conservation, a figure that is more than 1,000 GWh larger than the estimate given by NSP. Klein also found that "significantly greater amounts of conservation would be achievable" if the rate structure were changed to eliminate the disincentives for energy conservation. At least 2400 MW of wind capacity, sufficient to generate the same amount of electricity as that produced by Prairie Island "could be installed by NSP within the next five years". NSP's 1993 resource plan envisions 25-100 MW in this time frame. The ALJ's overall conclusion? "A combination of alternatives is capable of displacing Prairie Island's energy and capacity". ALJ Findings Nos. 157-162, 192, 151.
- ²⁹ *Nuclear Fuel .* July 5, 1993. Vol. 18. No. 14. p. 4.
- ³⁰ The 2.5 percent real annual increase in O&M cost was used because this figure was used in the recent interview with Howard. *Nucleonics Week.* November 12, 1993.
- ³¹ *Star Tribune.* July 27, 1993.
- ³² *Star Tribune.* July 27, 1993, p. 1B. The Prairie Island reactors cost the company about \$413 million to build. Westinghouse is also the subject of law suits from half a dozen utilities for steam generators that are now in 19 U.S. reactors. *Nuclear News.* September 1993.

³³ This includes the .1 cent per kWh charge for waste disposal. If Prairie Island is shut down no further radioactive waste would be generated.

³⁴ As part of his findings, issued in April 1992, Administrative Law Judge Allan Klein concluded that Prairie Island's total costs, including environmental costs were 4.41 cents per kWh. *Findings of Fact, Conclusions and Recommendation, In the Matter of an Application for a Certificate of Need for Construction of an Independent Spent Fuel Storage Installation* . April 10, 1992. Docket No. E-002/CN-91-19. Finding No. 28. The cost of prematurely decommissioning the plant and of recovering the plant depreciation on an accelerated time schedule would be the same whether Prairie Island is closed or remains operating. The difference is that these costs might be paid out over a shorter period but the PUC has the authority to recover these costs over an extended period. NSP estimates that if the costs of decommissioning and unrecovered depreciation were to occur over a 5 year period it could raise customer rates by about 8 percent over that period, after which rates would decline by that amount. But the PUC could require that these costs be paid over an extended period of time, therefore not increasing rates in the short term.