



## **DEMAND TRENDS, RESOURCE TRADE-OFFS AND RENEWABLE ENERGY OPPORTUNITIES**

**Presentation to the Minnesota Legislature**

**Joint Committee: Legislative Energy Commission**  
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1



## **MINNESOTA RESOURCE ASSESSMENT STUDY**

*Energy is likely to grow in the future.*

How much? Actual forecast numbers. What level of growth is desirable.

*There is no "silver bullet."*

That is the silver bullet. Multiplicity of solutions for demand and supply provide optimum benefit.

*How generation and transmission are planned.*

Utility can't favor its own generation, can have open integrated planning. [FERC Orders 888, 889]

*Prediction of 1.5% conservation as maximum.*

*Prediction of reliance on coal. Build for a peak demand that may be only a few hours per year.*

**Legislature is not consumer of policy.**

2



### **EFFICIENCY, DEMAND MANAGEMENT, DISTRIBUTED GENERATION INCREASE ECONOMIC VITALITY, NOT UTILITY DEMAND**

DOC Resource Assessment Study assumed no change in demand for electric utility power other than cyclical recession. This is a choice.

Efficiency, demand management and distributed renewable generation increase jobs, economic productivity and quality of life.

- Production, purchase and installation of more efficient appliances;
- Purchase and installation of insulation, more energy-efficient windows;
- Purchase and installation of smart grid controls on a community and individual basis, using energy at non-peak times;

Purchase and installation of solar panels for residences and businesses

3



### **THE CONCEPT OF "BASELOAD" POWER IS OUT-OF-DATE**

- Electricity grids are already designed to handle variability in both demand and supply.
- For large amounts of wind power connected to the grid from geographically dispersed wind farms, total wind power generally varies smoothly and therefore cannot be described accurately as 'intermittent.'
- Peak load management systems, including advanced computer-driven technologies can provide sophisticated peak management and enhance reliability.
- The development of natural gas peaking technologies and a diverse and competitive market where utilities can purchase power have changed the paradigm where a utility must have a set of power plants capable of running all the time to assure reliability

[Additional Information see Mark Diesendorf, [The Base-Load Fallacy](#) (2007) Institute of Environmental Studies, University of New South Wales, Australia ]

4



### ACTUAL AND FORECASTED PEAK DEMAND FOR ELECTRICITY HAS DECLINED

The Resource Assessment Study (p.6) featured a forecast graph with no real data. *This is real data.*

- Securities and Exchange Commission filings demonstrate that Xcel Energy’s peak demand declined 11.79% from 2006 to 2008.
- The Prairie Island Nuclear Plant certificate of need case shows a decline in forecasted demand:
  - In its Application, Xcel Energy projected demand growth of 1.1 percent (133 MW) each year.
  - Xcel provided a Supplemental filing based on Xcel’s 2008 rate case, dropping demand.
  - In discovery, Xcel provided an updated “2010 Budget Forecast” dropping demand even more.
  - Compared to the forecast in the cask expansion Application, by 2023 Xcel’s demand will be reduced by 1,549 MW, more than the total 1,100 MW supplied by the Nuclear Plant.

[SEC Filings, Evidentiary record, PINGP Study Group Brief, Prairie Island Nuclear Plant certificate of need cases]



DATE OF FORECAST Comparison Made	Xcel Current Forecast
<b>2008</b> Compared to Supplement Compared to Application	8,694 MW (873 MW) unknown
<b>2012</b> Compared to Supplement Compared to Application	<b>9,506 MW</b> <b>(429 MW)</b> <b>(803 MW)</b>
<b>2023</b> Compared to Supplement Compared to Application	<b>9,925 MW</b> <b>(936 MW)</b> <b>(1,549 MW)</b>

[Application, Ex. 104, Ex. 146, Prairie Island Nuclear Plant certificate of need cases]



### **CONTINUED RELIANCE ON NUCLEAR AND COAL FOSSIL FUEL PLANTS CREATES A RESOURCE TRADE-OFF WITH RENEWABLE ENERGY**

Renewable energy standards are based on a percentage of retail energy sales. As electric demand declines or grows more slowly, the RES follows.

Reliance on nuclear and coal plants creates a resource trade-off with development of wind energy.

With a contracted market for renewable energy, investments in wind turbines and wind farms become more precarious.

EXAMPLE: Operation of the Prairie Island Nuclear Plant provides a resource trade-off with renewable energy. In a wind/gas alternative, approximately 1,000 MW of wind would be used to replace nuclear capacity.

[Evidentiary record, Prairie Island Nuclear Plant certificate of need cases.]



### **THE FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE PRAIRIE ISLAND NUCLEAR PLANT DESCRIBED BENEFITS OF REPOWERING**

- The FEIS for the Prairie Island Nuclear Plant, prepared by the Office of Energy Security explained:

If NGCC [natural gas combined cycle] plant was sited at Prairie Island, no new transmission facilities would be required. Ex. 64, Ch. 2, p. 58 (FEIS)

A study commissioned by the Minnesota Legislature concluded that there is potential for locating 600 megawatts (MW) of dispersed renewable generation within Minnesota's existing transmission infrastructure. . . Depending on the transmission needs for the remainder of the renewable resource capacity required, environmental impacts from transmission lines for renewable resource technologies could be less than those for fossil fuel technologies. *Id.*, pp. 62-63.



### **REPOWERING COAL PLANTS WITH NATURAL GAS SUPPORTS RENEWABLE ENERGY AND DEMAND, WHILE REDUCING EMISSIONS**

- Xcel has recently deferred a proposal to repower Black Dog coal plant units 3 and 4, which currently have a total nameplate capacity rating of 278 MW.
- If Black Dog were repowered with natural gas, total nameplate capacity rating would increase 472 MW, summer peak capacity by more than 370 MW.
- Repowering of coal plants to natural gas provides support for intermittent renewable energy, pending development of commercial-scale storage systems.
- Repowering of coal plants also reduces emissions which impair human health including mercury, particulates, nitrogen oxides and sulfur dioxide and emissions of carbon dioxide which contribute to global climate change.

[Evidentiary record, Prairie Island Nuclear Plant certificate of need cases, Metro Emissions Reduction Project filings.]

9



### **LEGISLATIVE ROLE IN MOVING MINNESOTA TOWARD EFFICIENCY AND DIVERSE AND DISPERSED RENEWABLE ENERGY**

- Study resource trade-offs and impacts on renewable energy from continued or increased reliance on nuclear and coal plants (given demand).
- Require an up-to-date analysis of repowering the Prairie Island Nuclear Plant to natural gas, along with wind energy, to meet future growth in demand before considering cask expansion.
- Amend certificates of need statutes to optimize transmission and generation, evaluate lower voltage transmission upgrades and distributed renewable generation alternatives.
- Amend certificate of need statutes to require analysis of smart grid, demand management before approving energy facilities to serve peak demand.
- Seek diverse and independent sources of information on energy needs and economic benefits.

10



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