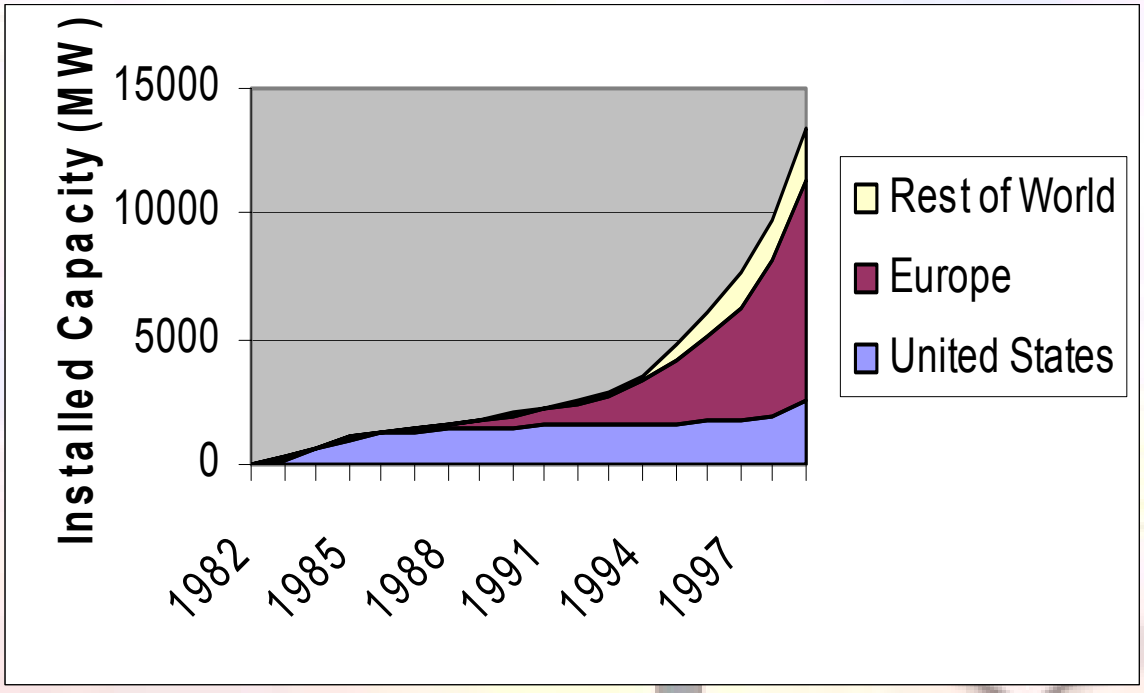
Xcel Energy
Wind Generation

Rick Halet

Principal Engineer

The Power of Wind

Taking Off Worldwide



Wind Leaders:

1. **Germany**
2. **United States**
3. **Spain**
4. **Denmark**
5. **India**

Total (end of 2000): nearly 17,000 MW

Based on information supplied by International Energy Agency.

Xcel Energy: 464 MW in 2001

Xcel Energy is #1

Xcel Energy Wind
In Operation

Purchase	Own	Location
301 MW		MN
24 MW		WY
31.2 MW	26.4 MW	CO
.7 MW		NM

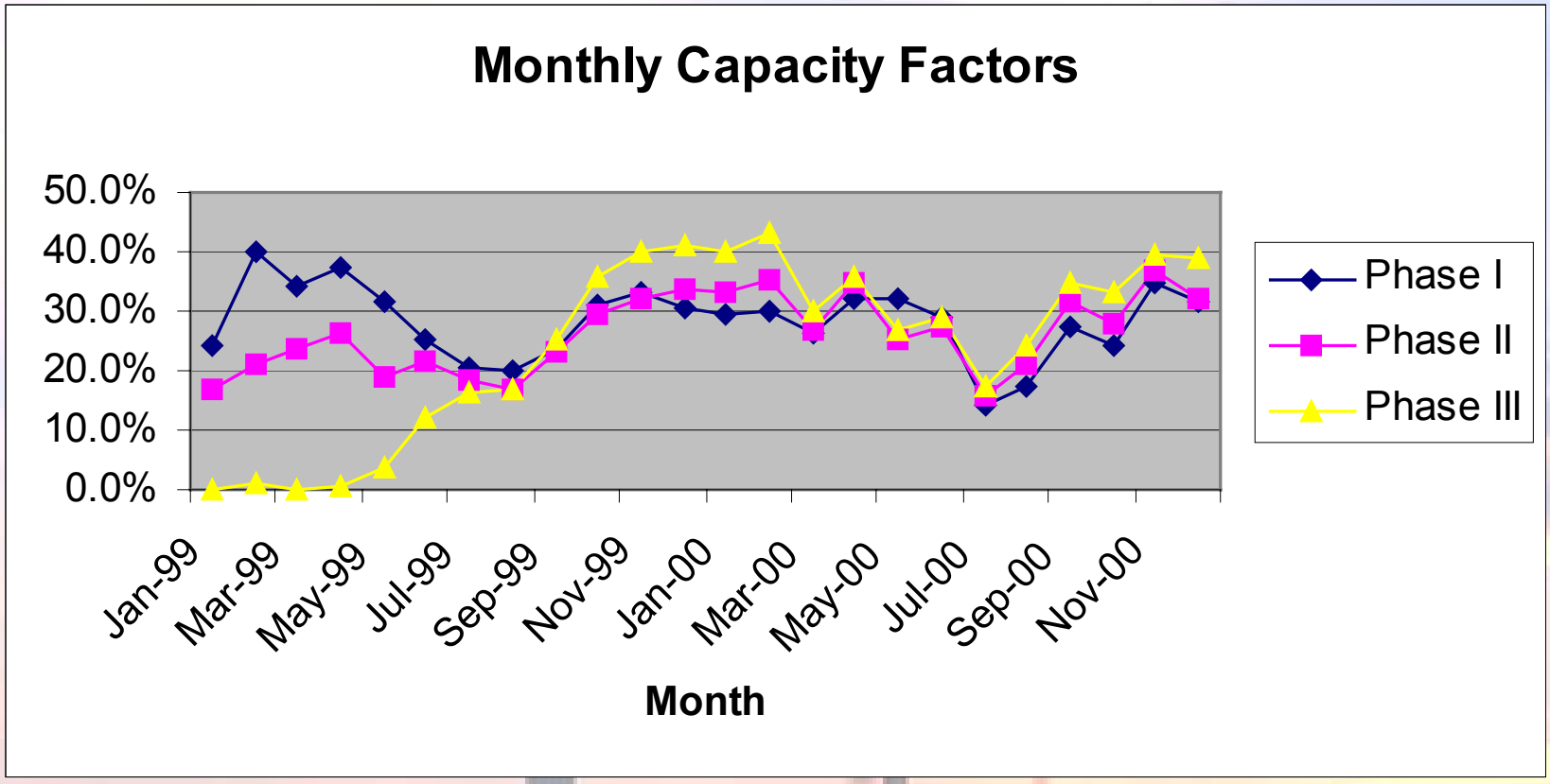
Xcel Energy Wind Contract Signed

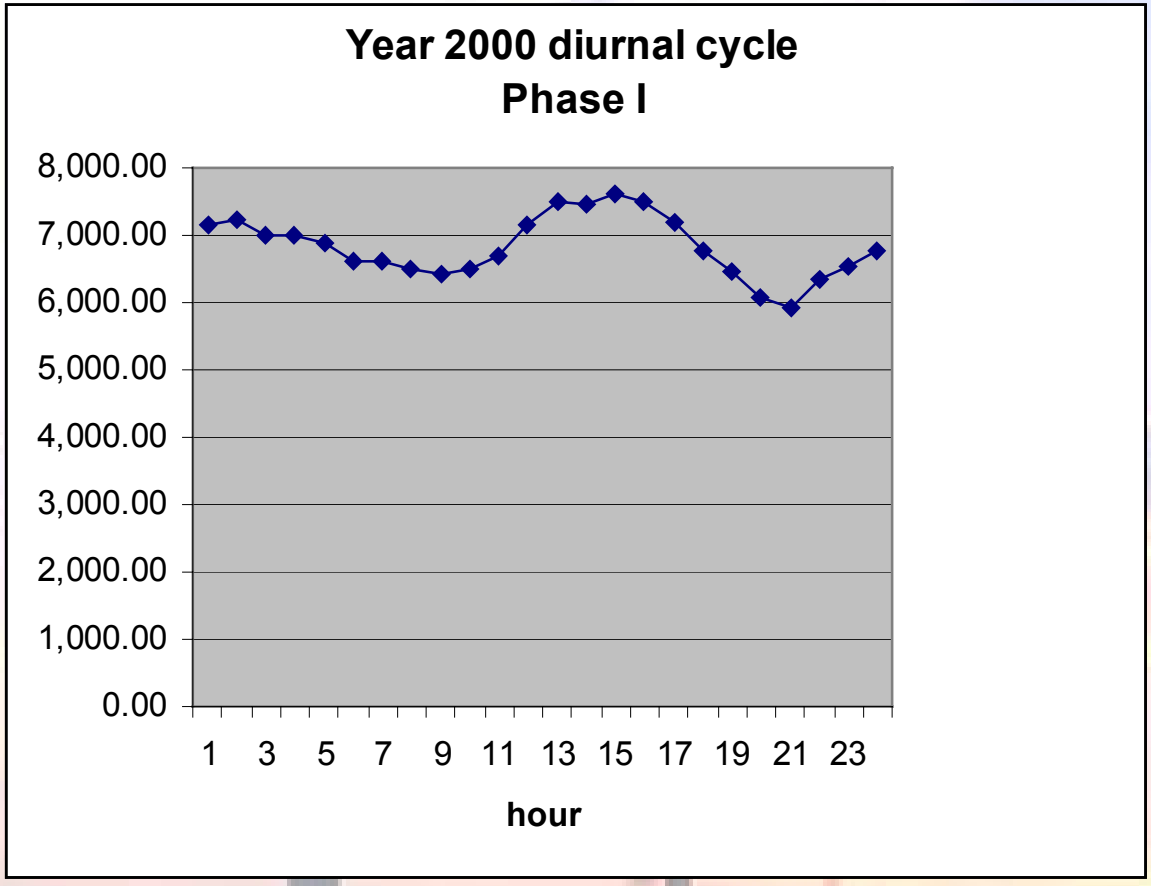
Purchase	Own	Location
80 MW		TX
51 MW		MN

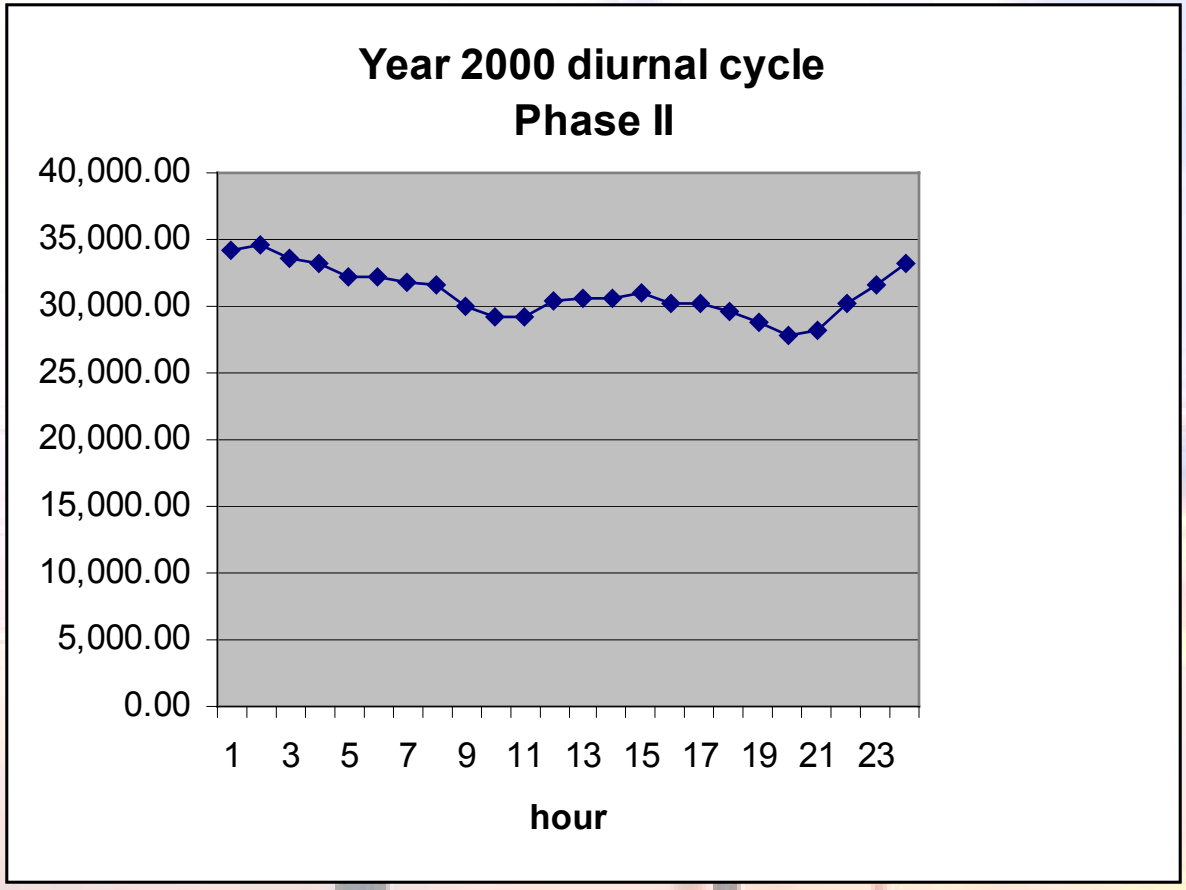
Xcel Energy Wind Contract Awarded

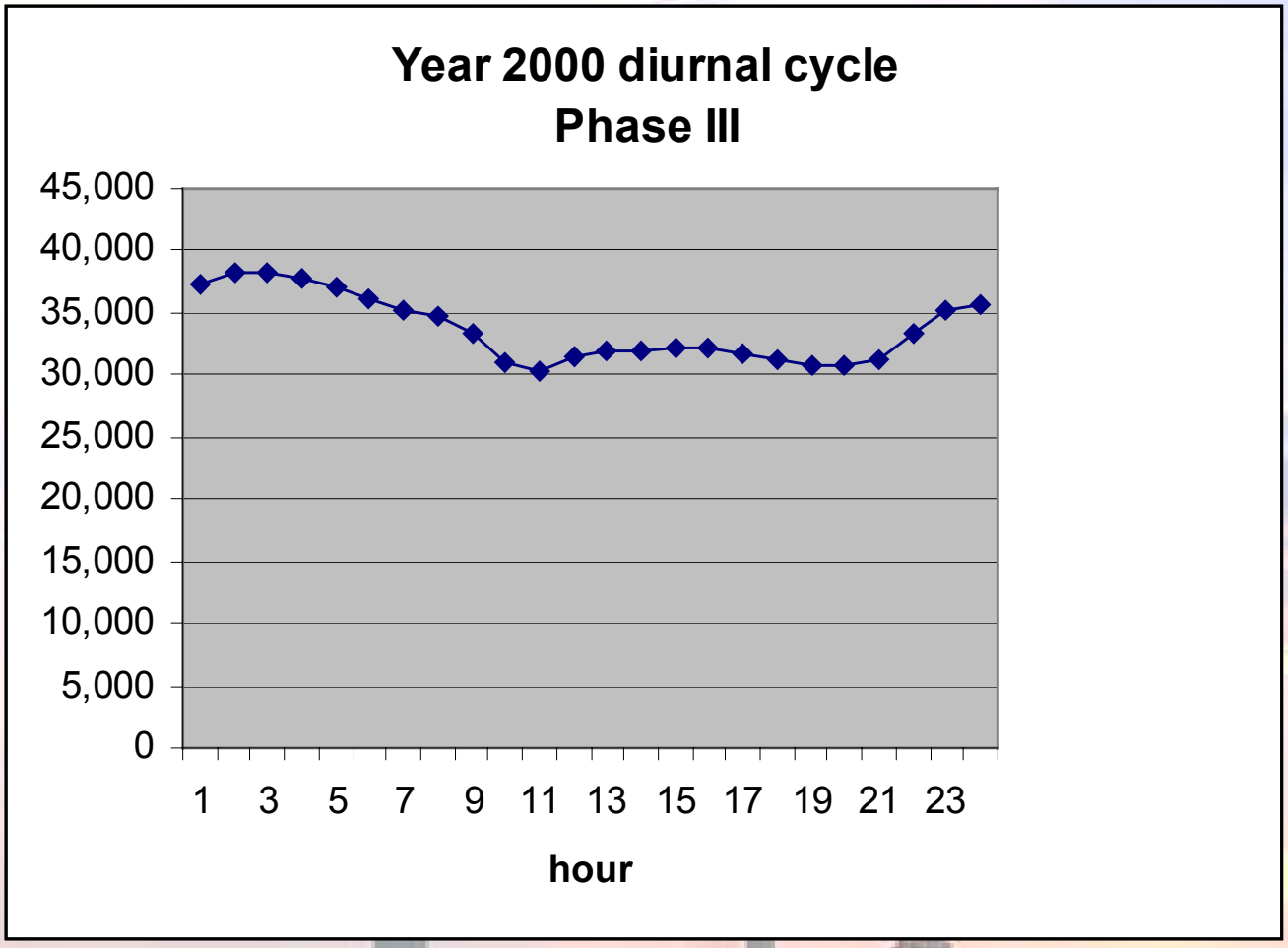
Purchase	Own	Location
162 MW		CO
80 MW		MN

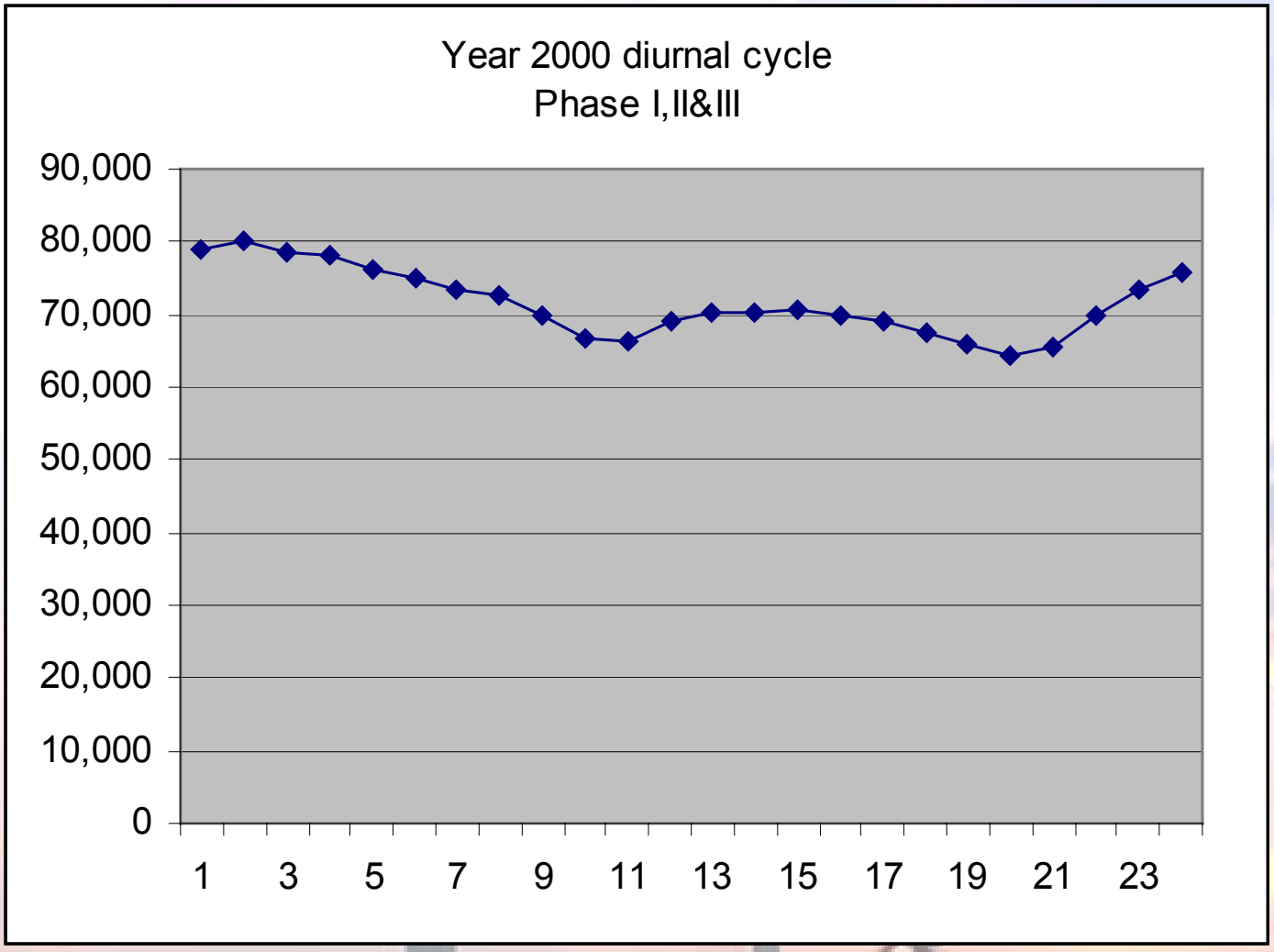
Wind's challenge

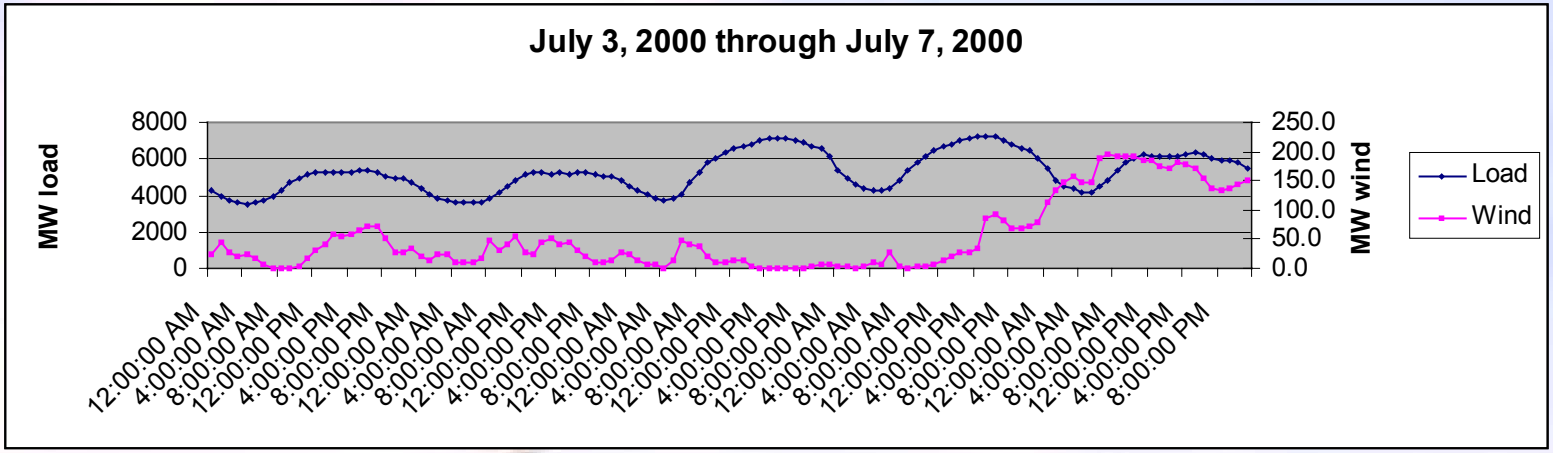

Monthly Capacity Factors
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Jan-99
Mar-99
May-99
Jul-99
Sep-99
Nov-99
Jan-00
Mar-00
May-00
Jul-00
Sep-00
Nov-00
Month
Phase I
Phase II
Phase III

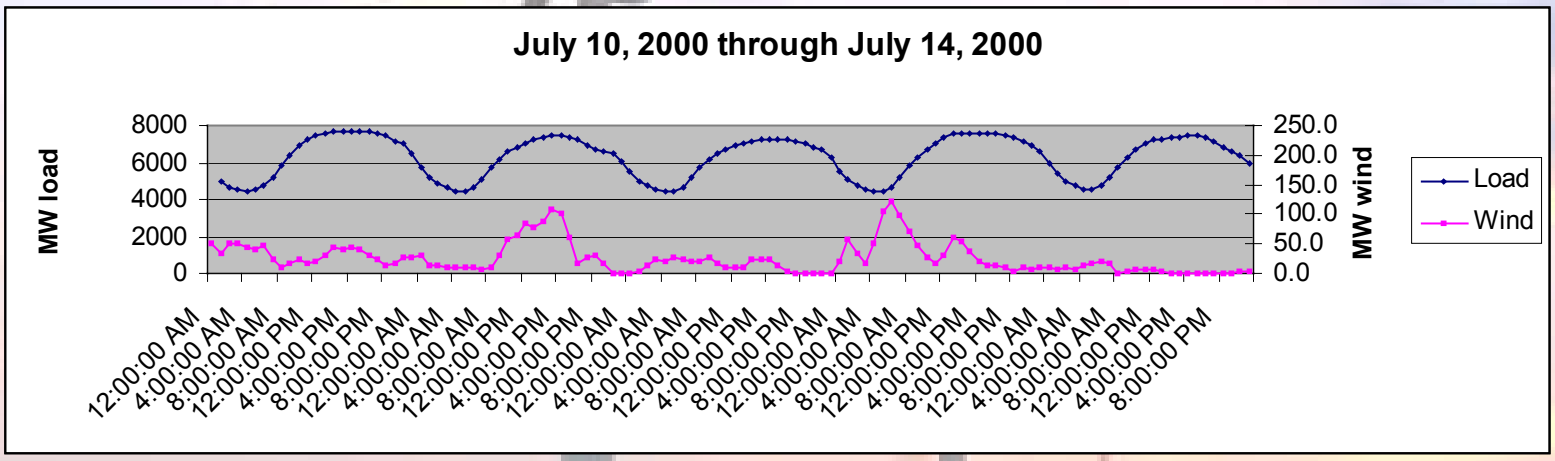

Year 2000 diurnal cycle
Phase I
8,000.00
7,000.00
6,000.00
5,000.00
4,000.00
3,000.00
2,000.00
1,000.00
0.00
1
3
5
7
9
11
13
15
17
19
21
23
hour


Year 2000 diurnal cycle
Phase II
40,000.00
35,000.00
30,000.00
25,000.00
20,000.00
15,000.00
10,000.00
5,000.00
0.00
1
3
5
7
9
11
13
15
17
19
21
23
hour

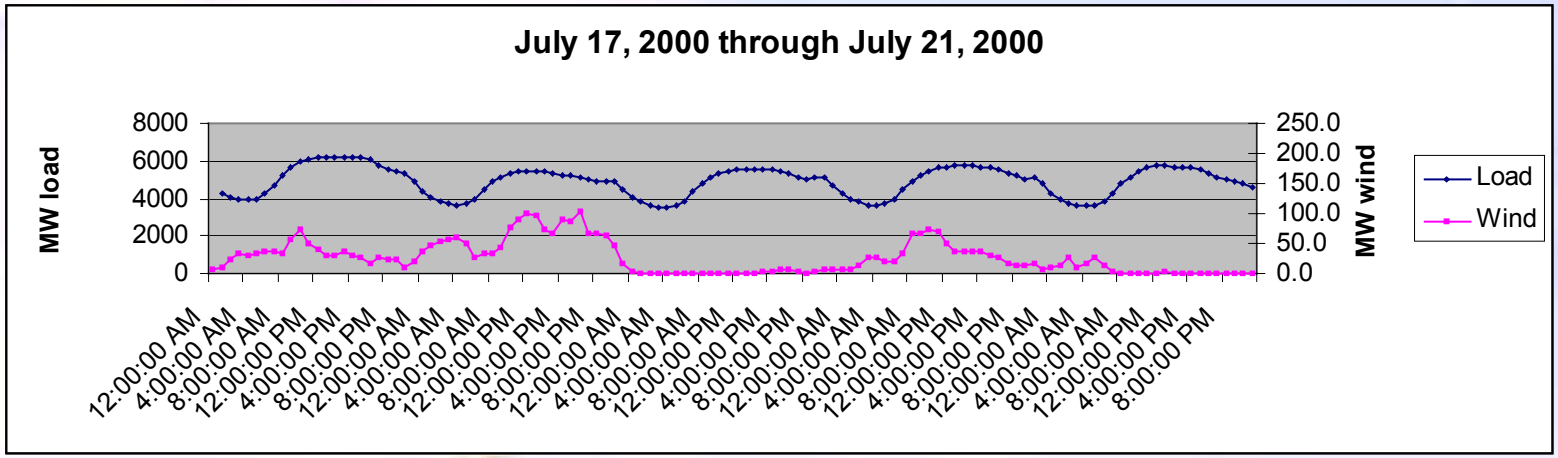

Year 2000 diurnal cycle
Phase III
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1
3
5
7
9
11
13
15
17
19
21
23
hour

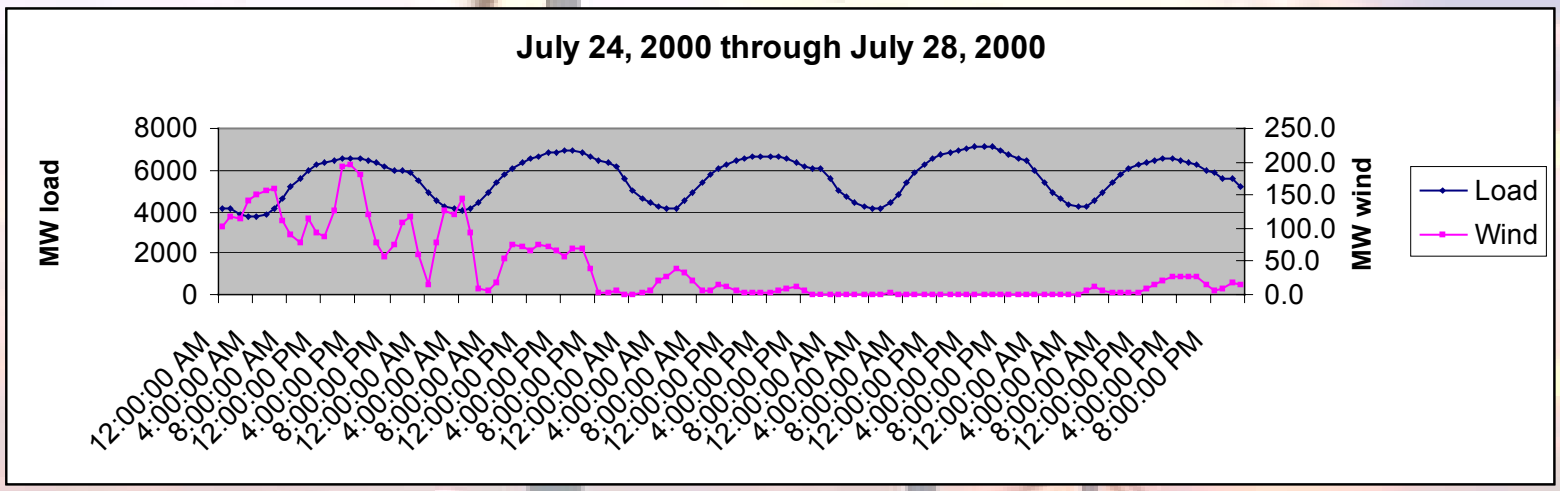

Year 2000 diurnal cycle
Phase I,II&III
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1
3
5
7
9
11
13
15
17
19
21
23



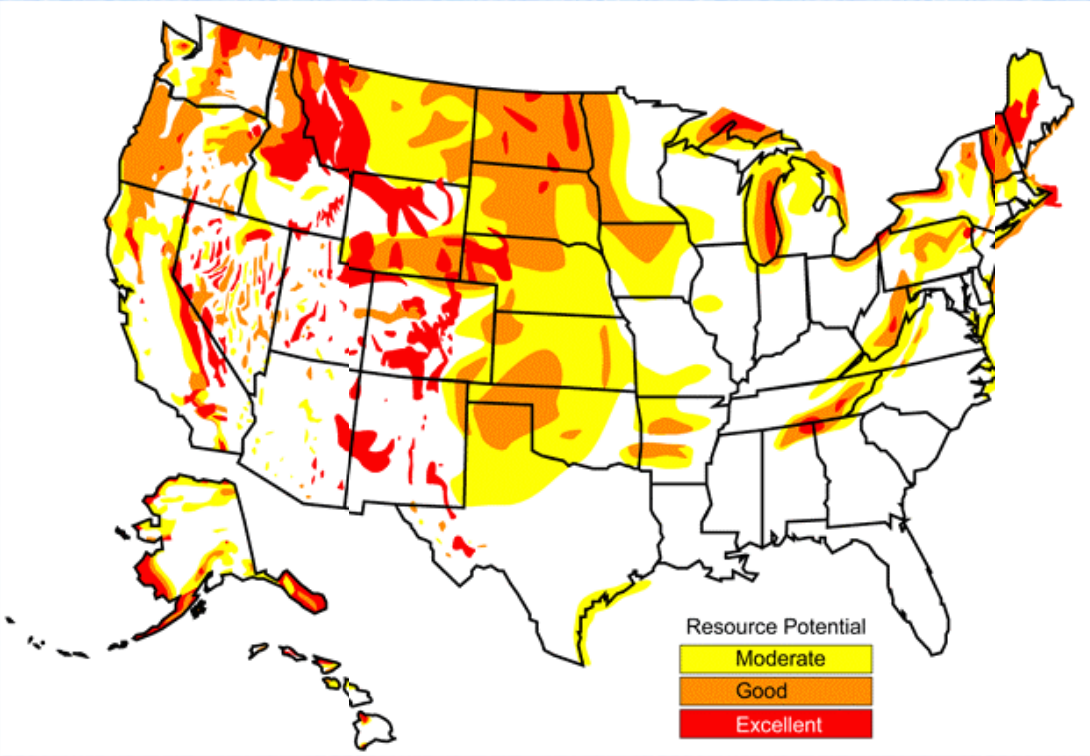


Load peak July 10, 2000 17:00


July 17, 2000 through July 21, 2000
MW load
8000
6000
4000
2000
0
MW wind
250.0
200.0
150.0
100.0
50.0
0.0
Load
Wind
12:00:00 AM
4:00:00 AM
8:00:00 AM
12:00:00 PM
4:00:00 PM
8:00:00 PM


July 24, 2000 through July 28, 2000
MW load
8000
6000
4000
2000
0
MW wind
250.0
200.0
150.0
100.0
50.0
0.0
Load
Wind
12:00:00 AM
4:00:00 AM
8:00:00 AM
12:00:00 PM
4:00:00 PM
8:00:00 PM

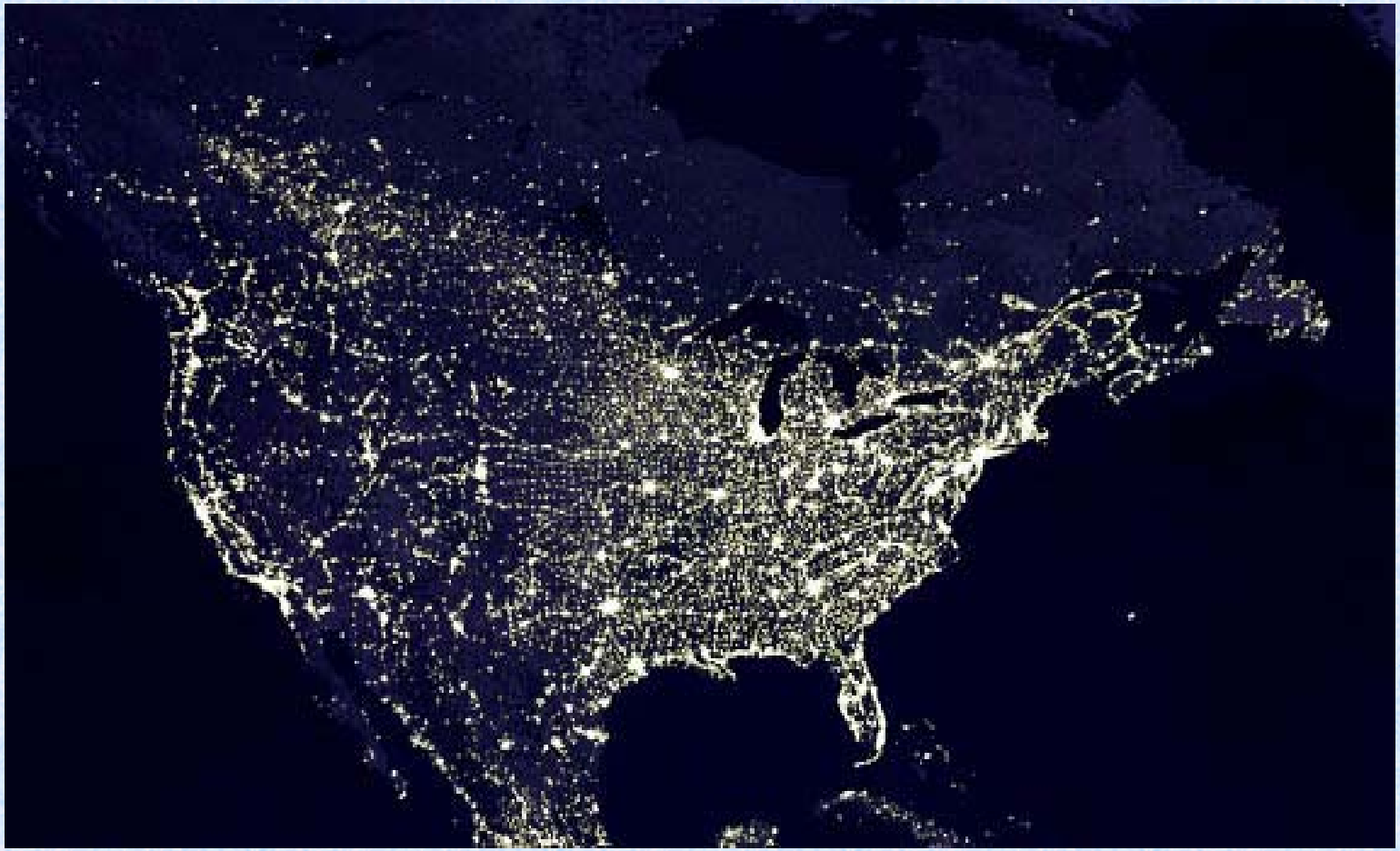
An All American Resource



Rank	State
1	North Dakota
2	Texas
3	Kansas
4	South Dakota
5	Montana
6	Nebraska
7	Wyoming
8	Oklahoma
9	Minnesota
10	Iowa
11	Colorado
12	New Mexico
13	Idaho
14	Michigan
15	New York
16	Illinois
17	California

World Class Wind Potential

Germany's Potential: 100 GW
North Dakota's Potential: 250 GW



Xcel Energy Wind RFP Scoring

Price	650
Energy Production	85
Development & Viability	265
Total	1000 points

Xcel Energy Wind
RFP Scoring

Formulaic	805 points
Judgement	195 points