

Temporal Energy Variation

Site	ERA5_Lat-24.50_Long114.0
Turbine	V172
Gross CF	65.34%
Net CF	50.02%
Average Wind Speed	8.475

1) Percentage of Annual Energy

Percentage of Annual Energy [%]	Hour of the Day												
	0	1	2	3	4	5	6	7	8	9	10	11	12
January	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
February	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%
March	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%
April	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%
May	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%
June	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%
July	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%
August	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%
September	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
October	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%
November	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
December	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%
Hourly Average	4.81%	4.70%	4.60%	4.51%	4.42%	4.34%	4.14%	3.99%	3.72%	3.35%	3.12%	2.96%	2.83%

2) Average Gross Capacity Factor

Gross CF [%]	Hour of the Day
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	0	1	2	3	4	5	6	7	8	9	10	11	12
January	80%	78%	76%	75%	73%	72%	67%	63%	58%	55%	51%	48%	48%
February	75%	72%	70%	69%	67%	66%	61%	59%	53%	50%	47%	44%	41%
March	78%	76%	73%	71%	70%	68%	64%	62%	55%	51%	48%	43%	39%
April	75%	73%	70%	68%	66%	65%	62%	61%	54%	46%	44%	40%	35%
May	66%	64%	63%	63%	62%	61%	60%	59%	56%	45%	42%	42%	38%
June	63%	63%	62%	62%	62%	63%	62%	62%	61%	52%	44%	45%	44%
July	65%	64%	64%	63%	63%	63%	62%	62%	60%	50%	43%	44%	44%
August	74%	72%	70%	69%	67%	66%	64%	63%	59%	48%	47%	48%	46%
September	80%	77%	76%	74%	71%	70%	67%	65%	56%	55%	55%	52%	48%
October	84%	82%	80%	79%	77%	75%	71%	66%	61%	59%	54%	50%	48%
November	83%	82%	80%	78%	75%	73%	69%	64%	62%	59%	55%	51%	50%
December	82%	81%	79%	78%	77%	75%	71%	66%	63%	59%	55%	51%	51%
Hourly Average	75%	74%	72%	71%	69%	68%	65%	63%	58%	52%	49%	46%	44%

3) Average Net Capacity Factor of Wind Farm

Days in Month	Net CF [%]	Hour of the Day												
		0	1	2	3	4	5	6	7	8	9	10	11	12
31	January	61%	60%	59%	57%	56%	55%	51%	48%	45%	42%	39%	37%	37%
28.25	February	57%	55%	54%	53%	52%	50%	46%	45%	41%	39%	36%	33%	32%
31	March	60%	58%	56%	55%	53%	52%	49%	48%	42%	39%	37%	33%	30%
30	April	57%	56%	54%	52%	51%	49%	47%	46%	42%	35%	34%	30%	27%
31	May	50%	49%	48%	48%	47%	47%	46%	45%	43%	34%	32%	32%	29%
30	June	48%	48%	48%	48%	48%	48%	48%	48%	47%	40%	34%	34%	34%
31	July	50%	49%	49%	48%	48%	48%	47%	47%	46%	38%	33%	34%	34%
31	August	57%	55%	54%	53%	52%	51%	49%	48%	45%	36%	36%	37%	35%
30	September	61%	59%	58%	56%	55%	53%	51%	49%	43%	42%	42%	40%	37%
31	October	64%	63%	61%	60%	59%	57%	54%	50%	47%	45%	42%	38%	37%
30	November	64%	62%	61%	59%	58%	56%	53%	49%	47%	45%	42%	39%	38%
31	December	63%	62%	61%	60%	59%	58%	54%	51%	48%	45%	42%	39%	39%
	Average	57.7%	56.4%	55.2%	54.1%	53.0%	52.0%	49.6%	47.9%	44.6%	40.2%	37.4%	35.6%	34.0%

4) Year-to-Year Variation

Percentage of Long-Term Annual Output [%]														All Year
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1990	9.3%	6.0%	9.5%	8.0%	8.7%	7.7%	7.3%	8.2%	8.4%	9.3%	10.2%	10.1%	102.8%	
1991	10.1%	8.5%	8.5%	7.1%	4.7%	5.1%	6.1%	7.9%	8.6%	9.0%	10.7%	10.0%	96.4%	
1992	8.7%	8.5%	7.5%	5.0%	6.7%	5.4%	6.8%	8.2%	8.7%	9.7%	9.0%	9.7%	93.9%	
1993	9.4%	9.4%	10.1%	8.3%	8.4%	7.6%	7.1%	8.5%	7.8%	9.9%	8.7%	9.2%	104.3%	
1994	10.3%	8.3%	8.2%	8.7%	7.1%	6.6%	7.4%	7.7%	8.0%	9.2%	10.0%	9.4%	100.8%	
1995	9.9%	5.9%	7.7%	6.9%	7.4%	9.6%	6.3%	9.0%	8.1%	9.0%	8.5%	10.2%	98.6%	
1996	10.3%	7.5%	9.7%	7.6%	7.3%	4.4%	6.6%	7.7%	8.6%	8.6%	10.0%	9.7%	98.0%	
1997	8.0%	7.2%	9.3%	5.2%	7.5%	6.7%	8.4%	8.0%	8.1%	9.6%	8.6%	10.7%	97.2%	
1998	10.2%	8.5%	6.7%	6.5%	5.9%	7.0%	8.1%	6.7%	8.9%	10.2%	9.8%	8.8%	97.3%	
1999	10.0%	5.7%	9.0%	5.9%	4.7%	6.5%	6.7%	8.6%	7.3%	9.5%	8.6%	8.8%	91.2%	
2000	6.9%	7.4%	8.4%	7.3%	8.5%	7.1%	6.3%	8.2%	9.4%	10.4%	10.0%	9.6%	99.5%	
2001	8.9%	7.9%	9.0%	8.0%	6.6%	7.1%	8.7%	8.6%	9.2%	9.8%	9.1%	10.4%	103.5%	
2002	9.1%	8.3%	7.8%	7.0%	4.9%	6.5%	7.6%	8.5%	9.9%	10.3%	10.0%	9.6%	99.5%	
2003	9.8%	8.3%	7.6%	7.1%	5.9%	7.6%	7.5%	8.3%	8.7%	10.6%	9.4%	10.8%	101.7%	
2004	9.0%	7.9%	9.9%	7.3%	7.2%	5.2%	7.1%	8.8%	9.2%	9.4%	9.2%	9.7%	99.8%	
2005	10.9%	8.6%	6.9%	8.6%	4.1%	6.7%	7.7%	8.6%	9.5%	10.2%	10.2%	11.6%	103.6%	
2006	9.2%	6.1%	8.7%	9.4%	7.5%	6.1%	7.5%	7.3%	7.9%	9.5%	9.0%	9.0%	97.2%	
2007	10.9%	9.5%	9.8%	7.2%	7.9%	7.2%	6.2%	8.2%	9.6%	9.6%	9.7%	9.2%	105.0%	
2008	9.7%	7.6%	8.4%	7.8%	7.6%	8.7%	6.3%	8.9%	9.0%	10.4%	9.8%	10.5%	104.7%	
2009	10.5%	7.1%	10.0%	7.3%	7.6%	6.7%	7.7%	7.0%	9.8%	9.0%	9.0%	9.5%	101.2%	
2010	9.6%	8.2%	9.2%	8.1%	8.1%	7.7%	9.0%	8.3%	9.2%	10.4%	8.1%	9.3%	105.0%	
2011	7.2%	6.3%	9.1%	7.3%	7.5%	6.6%	5.2%	7.5%	9.1%	8.6%	9.8%	9.1%	93.4%	
2012	7.8%	8.7%	7.9%	7.9%	7.8%	6.8%	7.9%	8.0%	7.6%	8.4%	9.8%	8.1%	96.9%	
2013	9.0%	7.2%	8.8%	6.4%	7.0%	8.7%	7.7%	8.0%	8.4%	9.5%	9.6%	9.4%	99.6%	

2014	9.7%	7.4%	9.0%	7.5%	6.9%	7.9%	7.3%	6.5%	7.7%	9.5%	9.1%	11.0%	99.6%
2015	9.4%	7.3%	5.9%	7.0%	8.1%	5.7%	7.5%	7.4%	8.2%	9.0%	8.8%	9.6%	94.0%
2016	6.2%	7.8%	7.5%	9.0%	8.6%	6.1%	8.0%	8.4%	9.6%	9.0%	10.0%	10.8%	101.0%
2017	9.4%	6.8%	9.3%	8.2%	7.3%	7.5%	7.6%	9.0%	8.0%	9.8%	9.1%	9.4%	101.4%
2018	9.9%	8.2%	8.7%	8.5%	8.3%	6.8%	6.3%	8.7%	10.0%	9.1%	9.6%	10.9%	105.1%
2019	10.4%	9.5%	8.7%	8.7%	7.0%	7.5%	8.1%	8.8%	8.5%	9.8%	8.7%	9.5%	105.1%
2020	10.2%	6.7%	8.1%	8.7%	8.2%	5.4%	8.5%	8.3%	8.6%	10.3%	10.1%	9.4%	102.6%
2021	8.8%	8.6%	6.2%	8.2%	6.8%	7.7%	6.6%	8.5%	8.7%	9.9%	9.8%	10.2%	99.8%
2022	9.6%	7.0%	8.6%	7.3%	6.3%	6.9%	6.3%	9.1%	9.0%	10.7%	9.3%	9.3%	99.3%

5) Net Output Year-to-Year

Net Output [GWh]	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	All Year
1990	306	197.6	310.9	264.2	287.3	253.7	239.9	269.5	274.5	305.7	334.9	333.0	3377.4
1991	333.4	280.0	280.6	234.1	155.4	168.9	201.0	258.3	284.2	294.6	350.4	327.6	3168.3
1992	284.6	280.7	245.6	162.9	220.0	177.6	224.5	268.8	284.7	320.0	296.5	319.7	3085.5
1993	308.8	307.5	333.1	272.4	276.8	248.5	234.4	279.4	256.0	325.8	284.7	300.8	3428.3
1994	337.4	271.5	270.4	285.7	234.9	216.7	241.6	252.8	262.4	301.1	329.0	308.7	3312.3
1995	325.0	195.4	252.3	226.0	244.0	315.5	206.8	297.4	267.7	294.4	279.3	334.9	3238.7
1996	337.9	247.6	318.2	250.0	240.0	145.9	215.3	252.8	282.9	282.9	328.5	319.4	3221.4
1997	263.1	235.3	306.8	171.0	246.1	219.0	275.0	261.9	267.3	314.5	282.1	351.7	3193.6
1998	336.3	278.6	220.1	212.3	194.7	228.7	267.6	221.4	291.9	334.2	323.5	287.7	3197.1
1999	327.2	188.7	294.3	193.2	154.4	212.6	219.7	282.6	239.7	313.5	284.0	288.2	2998.2
2000	226.9	243.5	277.1	240.5	279.4	232.6	206.7	269.2	310.6	340.5	327.5	314.7	3269.2
2001	293.4	260.0	297.1	262.5	215.8	232.4	287.5	283.1	302.8	323.7	300.6	343.4	3402.3
2002	299.9	274.0	255.9	230.7	162.0	212.5	248.2	279.4	326.9	337.4	327.6	317.1	3271.5
2003	320.5	273.6	251.3	233.8	192.8	250.6	247.0	273.7	287.4	348.8	309.8	353.5	3342.8
2004	296.6	260.9	325.2	241.0	235.5	170.0	233.0	287.7	303.0	309.4	300.9	317.8	3281.0
2005	358.8	284.1	226.8	283.5	134.8	220.4	253.2	283.4	311.0	334.0	334.3	380.8	3405.2
2006	302.8	199.8	284.5	307.7	246.6	199.7	245.4	240.1	260.7	313.6	295.7	296.3	3192.9
2007	357.4	310.7	320.6	236.7	258.2	237.5	204.7	270.8	314.7	315.6	319.5	303.9	3450.2
2008	318.5	249.9	275.6	255.7	249.6	285.9	207.6	294.0	295.9	342.1	322.8	343.5	3441.1
2009	346.0	233.3	328.2	238.7	248.5	219.4	253.6	230.9	323.6	294.3	296.6	313.2	3326.3
2010	314.6	271.0	301.2	265.4	265.6	252.0	295.8	273.0	300.9	341.1	266.1	305.0	3451.7

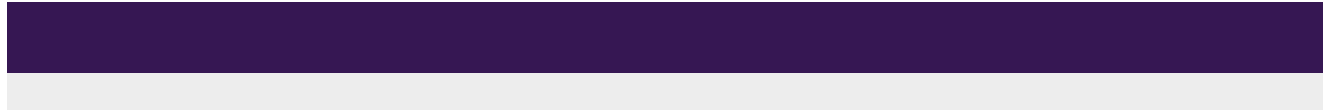
2011	235.2	207.9	299.2	238.3	246.3	216.6	171.4	247.4	300.7	283.9	323.2	299.9	3070.1
2012	256.1	287.2	258.5	261.0	254.7	224.8	260.5	263.7	250.7	277.2	322.7	267.8	3184.8
2013	296.0	235.4	289.3	211.7	231.7	284.8	251.5	261.7	274.4	311.9	317.1	308.7	3274.4
2014	318.1	243.8	296.2	246.7	226.6	260.9	240.8	214.9	254.3	311.4	298.6	360.2	3272.5
2015	307.7	240.5	195.3	229.8	265.1	186.9	248.0	244.2	269.7	297.2	289.6	315.9	3089.8
2016	202.3	255.8	248.1	297.2	282.3	201.6	263.9	275.2	314.8	295.7	328.9	353.4	3319.0
2017	308.7	224.1	307.0	268.6	239.5	245.0	251.1	295.4	263.2	322.3	297.5	309.3	3331.5
2018	325.3	270.5	287.3	278.5	272.9	223.8	208.4	286.9	329.4	298.7	315.1	356.7	3453.6
2019	341.4	310.7	284.3	284.3	231.1	246.1	265.3	289.1	279.0	321.4	286.6	313.3	3452.6
2020	335.1	220.8	266.4	284.3	270.9	177.5	280.6	274.3	282.6	338.4	331.0	308.8	3370.6
2021	288.7	281.2	202.5	268.7	224.6	252.4	215.7	280.5	286.2	324.1	321.1	335.0	3280.8
2022	316.0	229.4	281.3	240.7	205.8	226.9	206.9	297.9	294.4	352.6	307.0	304.4	3263.4

6) Gross Capacity Factor (Percentage of Time)

% Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
0%-1%	5.0%	7.2%	7.0%	8.3%	9.5%	9.8%	9.1%	7.2%	4.5%	3.8%	3.6%	4.0%	10.2%
1%-10%	5.5%	6.8%	6.7%	7.2%	8.8%	8.5%	8.0%	6.5%	5.0%	4.2%	4.1%	4.3%	9.0%
10%-20%	5.3%	7.1%	6.6%	7.5%	9.2%	8.9%	8.6%	7.1%	6.0%	5.1%	4.5%	4.6%	8.9%
20%-30%	3.3%	3.9%	3.9%	4.3%	5.4%	5.2%	4.7%	4.0%	3.8%	3.1%	3.0%	3.0%	5.0%
30%-40%	5.6%	6.3%	6.5%	7.4%	8.5%	8.3%	8.3%	7.2%	6.3%	5.2%	5.2%	5.1%	7.9%
40%-50%	4.0%	4.5%	4.8%	5.7%	5.8%	6.2%	6.4%	5.3%	5.0%	4.1%	4.0%	3.6%	5.7%
50%-60%	4.3%	4.8%	5.0%	6.1%	6.2%	5.8%	6.4%	5.9%	5.3%	4.7%	4.5%	4.1%	5.8%
60%-70%	2.2%	2.6%	2.7%	3.1%	3.0%	3.1%	3.4%	3.1%	3.0%	2.7%	2.4%	2.1%	3.0%
70%-80%	4.4%	4.7%	5.2%	6.4%	5.8%	6.3%	6.4%	6.6%	5.6%	5.3%	5.4%	4.6%	5.7%
80%-90%	4.6%	5.1%	5.6%	6.0%	6.1%	6.3%	6.3%	6.7%	6.2%	5.5%	5.6%	4.8%	5.7%
90%-98%	7.4%	7.4%	8.7%	8.8%	8.8%	8.8%	9.0%	9.6%	9.9%	8.5%	9.0%	8.0%	8.1%
98%-100%	48.3%	39.6%	37.3%	29.1%	22.8%	23.0%	23.3%	30.7%	39.3%	47.9%	48.9%	51.7%	25.0%

7) Gross Capacity Factor (Percentage of Time)

% Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
<1%	5.0%	7.2%	7.0%	8.3%	9.5%	9.8%	9.1%	7.2%	4.5%	3.8%	3.6%	4.0%	10.2%

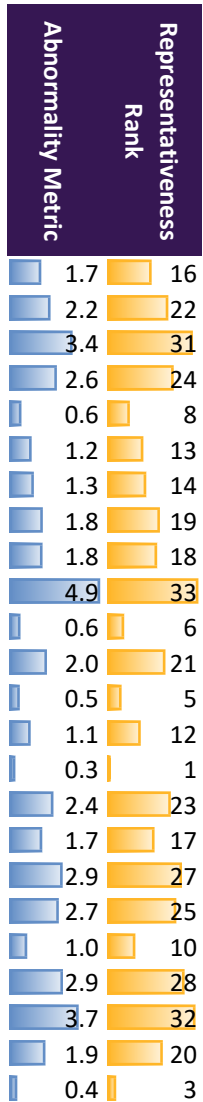


BY	13	14	15	16	17	18	19	20	21	22	23	Monthly Average
	0.3%	0.3%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	9.3%
	0.2%	0.2%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	7.7%
	0.2%	0.2%	0.3%	0.3%	0.4%	0.4%	0.5%	0.5%	0.5%	0.4%	0.4%	8.5%
	0.2%	0.2%	0.2%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	7.6%
	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	7.1%
	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	6.9%
	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	7.3%
	0.2%	0.2%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	8.1%
	0.2%	0.3%	0.3%	0.4%	0.4%	0.4%	0.5%	0.5%	0.4%	0.4%	0.4%	8.7%
	0.3%	0.3%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	9.6%
	0.3%	0.3%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	9.4%
	0.3%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	9.8%
	2.84%	3.08%	3.52%	4.06%	4.57%	4.94%	5.22%	5.22%	5.13%	5.02%	4.92%	100.0%

BY

13	14	15	16	17	18	19	20	21	22	23	Monthly Average
52%	60%	72%	83%	89%	91%	91%	89%	86%	84%	82%	71.8%
42%	47%	57%	70%	80%	84%	86%	85%	82%	80%	77%	65.1%
38%	42%	50%	62%	74%	81%	86%	85%	84%	82%	81%	65.2%
32%	33%	39%	48%	62%	74%	81%	81%	80%	78%	77%	60.2%
35%	34%	35%	39%	47%	58%	67%	69%	69%	68%	66%	54.5%
42%	40%	40%	41%	43%	50%	59%	63%	64%	64%	64%	54.9%
42%	41%	41%	43%	47%	54%	64%	67%	68%	67%	66%	56.1%
44%	44%	47%	52%	61%	71%	79%	80%	79%	78%	76%	62.7%
47%	51%	58%	68%	80%	86%	89%	88%	86%	84%	82%	69.3%
50%	57%	69%	83%	91%	93%	94%	92%	89%	88%	86%	74.0%
55%	65%	77%	89%	94%	94%	94%	92%	89%	87%	85%	75.1%
55%	65%	78%	88%	93%	94%	94%	91%	88%	86%	84%	75.2%
44%	48%	55%	64%	72%	78%	82%	82%	80%	79%	77%	65.3%

by	13	14	15	16	17	18	19	20	21	22	23	Monthly Average
	40%	46%	55%	63%	68%	70%	70%	68%	66%	64%	63%	54.9%
	32%	36%	44%	53%	61%	64%	66%	65%	63%	61%	59%	49.9%
	29%	32%	39%	47%	57%	62%	66%	65%	64%	63%	62%	49.9%
	25%	26%	30%	37%	47%	57%	62%	62%	61%	60%	59%	46.1%
	27%	26%	27%	30%	36%	44%	51%	53%	53%	52%	51%	41.7%
	32%	31%	31%	31%	33%	38%	45%	48%	49%	49%	49%	42.0%
	32%	31%	31%	33%	36%	42%	49%	52%	52%	51%	51%	43.0%
	34%	34%	36%	40%	47%	54%	60%	61%	61%	59%	58%	48.0%
	36%	39%	44%	52%	61%	66%	68%	67%	66%	64%	63%	53.0%
	38%	43%	53%	63%	70%	71%	72%	70%	69%	67%	66%	56.6%
	42%	49%	59%	68%	72%	72%	72%	70%	68%	67%	65%	57.5%
	42%	50%	60%	67%	71%	72%	72%	70%	68%	66%	64%	57.6%
	34.1%	36.9%	42.3%	48.8%	54.9%	59.4%	62.7%	62.7%	61.6%	60.3%	59.1%	50.0%



All Year Results

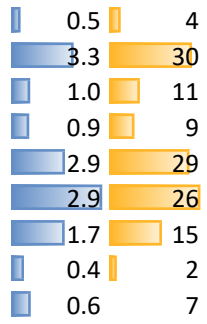
Maximum	105.1%
Minimum	91.2%
Std Dev	3.7%

Most Representative Years

1	2004
2	#N/A
3	2013
4	2014
5	2002

Most Abnormal Years

1	1992
2	2015
3	2018
4	2010
5	2007



All Year Results	
Maximum	#####
Minimum	#####
Std Dev	122.4

Capacity #####

NIGHT	All Year
3.0%	6.6%
3.6%	6.3%
4.6%	6.7%
3.0%	4.0%
5.5%	6.7%
4.2%	5.0%
4.7%	5.3%
2.6%	2.8%
5.4%	5.6%
5.7%	5.7%
9.2%	8.7%
48.4%	36.7%

NIGHT	All Year
3.0%	6.6%

6.6%	12.9%
11.2%	19.6%
14.2%	23.6%
19.7%	30.3%
23.9%	35.2%
28.6%	40.5%
31.2%	43.3%
36.6%	48.9%
42.3%	54.6%
51.6%	63.3%
100.0%	100%