Jim Pelley
Aerospace Engineer with 30 years experience
Ocotillo Resident for the past 7 years
Been enjoying the desert for over 40 years
I am an Aerospace Quality Control Engineer responsible for developing Quality Control inspection programs to inspect aircraft flight hardware.

I'm not a Meteorologist but my findings are In-Line with Patterns ERI report data \( \rightarrow 8.8 \text{ mph} - 10.7 \text{ mph} \)

In my wind study I have always said that the wind speeds in Ocotillo are NOT suitable for wind turbine generators.

Based on my findings, I see the average wind speeds to be around 8.9 mph, this was published by IV Press at a Jack Terrazas town meeting in Ocotillo back in Sept of 2011.

http://www.ivpressonline.com/news/ivp-news-ocotillo-residents-sound-off-on-wind-energy-project-20110918,0,2748542.story
Ocotillo Wind

Fact Sheet / March 2012

Location: Ocotillo, Imperial County, California

Number of Turbines: 112

Project Capacity: Approximately 300 MW

Power Equivalent: 140,000 homes

Target Construction Start: May 2012

Target Operation Start: December 2012

Permanent Jobs: Approximately 20

Construction Jobs: Up to 350

Construction Contractor: Blattner Energy

Estimated Tax Revenues: Approximately $5 million per year

The electricity produced annually by the Ocotillo wind project will offset more than 400,000 tons of carbon dioxide, equal to the annual emissions of 65,000 cars, and conserve more than 147,000,000 gallons of water each year, enough to supply 4,500 people with freshwater each day. Source: AWEA

Pattern is proud to become part of the Imperial Valley. Our Ocotillo Wind project is an investment in the region that will create many economic benefits, including the creation of construction and ongoing permanent employment positions, substantial growth in the property tax base, and the economic ripple effect resulting from the project.

Pattern is focused on being a responsible community partner by respecting the land, its resources and the people of the Imperial Valley. We have made contributions to the IV Desert Museum, IV Food Bank, Westside School, Ocotillo Community Park and Ocotillo Optimists’ Club, and we will continue to partner on causes important to the community.

The Ocotillo Wind project will be located on 12,436 acres of public lands administered by the BLM, with a small portion on lands under the jurisdiction of Imperial County. Once complete, the permanent footprint will be approximately 120 acres, or less than 1% of the total project area, preserving the overwhelming majority of the land in its natural state and allowing the project infrastructure to be sited in areas that do not directly impact cultural resources.

The development phase of the Ocotillo Wind project is nearing completion and the permit is expected to be before the Imperial County Planning Commission and the Board of Supervisors as early as March. With your support, Pattern’s Ocotillo Wind project will be the first of its kind in the Imperial Valley and begin harnessing the wind by the end of 2012.
112 Turbines

Fact Sheet
March 2012

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**Project Capacity** Approximately 300 Megawatts

**Power Equivalent** 140,000 Homes

**Simple Math:**

300 mw divided by 112 Turbines = 2.67 mw per Turbine

This would require approximately 28 mph constant wind speeds in order to produce 300 Megawatts with 112 Turbines

In order to Power 140,000 homes would require constant wind at 28 mph 24/7

The Fact is, Average Winds Speed in Ocotillo are approx. 10 mph
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This would require approximately **28 mph** constant wind speeds in order to produce 300 Megawatts with 112 Turbines in order to power **140,000 homes** would require constant wind at **28 mph 24/7**

The Fact is, Average Winds Speed in Ocotillo are approx. **10 mph**

**MISLEADING INFORMATION!**
Siemens Wind Turbine SWT-2.3-101

High availability

Currently, the Siemens fleet of 2.3 MW wind turbines sets the industry standard for availability. The SWT-2.3-101 will build on the reputation for reliability that the market has come to expect from a Siemens turbine.

Harvest more energy from sites with low and medium wind speeds

The Siemens SWT-2.3-101 turbine delivers unparalleled performance and reliability, making it especially suited to areas with low to medium wind speeds.

The best-in-class turbine offers low energy production costs, as availability of Siemens’ 2.3 product family is among the highest in the industry. The 101 meter rotor is specifically designed to optimize the energy returns in areas with limited wind speeds. The turbine is also ideal for all types of grid connections, as it offers the best support for grid connections in all major markets.

Designed to last

The SWT-2.3-101 is designed to last. The robust and reliable design offers a high yield with low maintenance costs. The turbine is backed by advanced condition monitoring and diagnostics, which constantly examine the turbine. Any change in a turbine’s performance is dealt with immediately by an experienced after-sales service team.

This Model produces \textit{up to} 2.3 mw

### Technical Specifications

**Rotor**
- Diameter: 107 m
- Swept area: 8,000 m²
- Rotar speed: 6-16 rpm

**Power regulation**: Pitch regulation with variable speed

**Blades**
- Type: B49
- Length: 40 m

**Aerodynamic brake**
- Type: Full-span pitching
- Activation: Active, hydraulic

**Transmission system**
- Gearbox type: 3-stage planetary/helical
- Gearbox ratio: 1:91
- Gearbox oil filtering: Inline and off-line
- Gearbox oil cooler: Separate oil cooler

**Mechanical brake**
- Type: Hydraulic disc brake

**Yaw system**
- Type: Active

**Monitoring system**
- SCADA system: WinWPS
- Remote control: Full turbine control

**Tower**
- Hub height: 80 m or site-specific

**Operational data**
- Cut-in wind speed: 3.4 m/s
- Cut-out wind speed: 25 m/s
- Maximum 3 s gust: 55 m/s (standard version)
- Maximum 10 s gust: 60 m/s (EC version)

**Weights**
- Rotor: 62 tons
- Nacelle: 62 tons
- Tower for 80-m hub height: 162 tons

**Power curve**
The calculated power curve data are valid for standard conditions of 15 degrees Celsius air temperature, 1013 hPa air pressure and 1.225 kg/m³ air density, clean rotor blades and horizontal, undisturbed air flow. The calculated curve data are preliminary.

### Nacelle Arrangement

1. Spinner
2. Spinner bracket
3. Blade
4. Pitch bearing
5. Rotor hub
6. Main bearing
7. Main shaft
8. Gearbox
9. Brake disc
10. Coupling
11. Gear train
12. Service crane
13. Meteorological sensors
14. Tower
15. Taw ring
16. Taw gear
17. Nacelle footplate
18. Oil filter
19. Canopy
20. Generator fan

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[Link to PDF](http://www.energy.siemens.com/hq/pool/hq/power-generation/wind-power/E50001-W310-A121-X-4A00_WS_SWT-2.3-101_US_1009.pdf)
### Siemens SWT-2.3-101 Specification data

#### Operational data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Cut-in speed range</th>
<th>Rated power range</th>
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</tr>
<tr>
<td>Rated power at</td>
<td>2000 kW</td>
<td>26.8 - 29.1 mph</td>
<td>22.4 m/s</td>
<td></td>
<td>60 m/s (IEC version)</td>
</tr>
<tr>
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<td></td>
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- Cut-in speed: 6.7 - 8.9 mph producing just under 200 kW of power.
- Cut-out speed: 26.8 - 29.1 mph producing 2.3 MW of power.

---

**Power [kW]**

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<tr>
<th>Wind [m/s]</th>
<th>0</th>
<th>11.2</th>
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- 26.8 – 29.1 mph producing 2.3 MW of power.
- 6.7 - 8.9 mph producing just under 200 kW of power. Cut-in speed.
Pattern says they have wind speed data from the MET towers for the last 2 years

I asked Pattern if I could get a copy of the Wind Speed data and Pattern told me no, it’s COMPETITION SENSITIVE and the only way they could let me see the data was if I signed a confidentiality agreement
With out having Pattern’s data, I did my wind study based on the data from a weather station located in Ocotillo which is located on a existing power tower just south of S2 at 695 feet of elevation:

Website:
Pattern’s reply to my Wind Speed Study

The weather station relied on by the commenter is located on a large lattice-tower type transmission pole. It appears the anemometer is placed approximately 5 feet from the supporting structure, and is located on the east/northeast side of the tower, and is thus downwind of the tower itself. It has been demonstrated through research and recommended by the International Electrotechnical Commission that anemometers must be placed at least 5 – 7 tower diameters away from the supporting structure to prevent significant wind flow distortion, and should be oriented so the instruments are not downwind of the tower. This deployment criterion is a standard in the wind energy business and ensures proper free stream wind measurements used in financeable wind resource reports.

Additionally, it appears the anemometer is no more than 20 feet above the ground level. The turbines proposed at the wind farm would be approximately 260 feet at hub height, and over 400 feet at blade tip. Due to the fact that wind generally increases with increasing height due to less frictional effects from the ground, the wind speeds reported in the comment are biased low compared to the hub height wind data used for wind energy production projections.

Lastly, the weather station data collected and analyzed by the commenter is from a station located less than 2/3 mile northeast of Sugarloaf Mountain. Because winds in this area are predominantly from the southwest, the presence of this large topographic feature upwind of the weather station may distort the wind flow during certain times by creating a wind break, thus causing lower winds speeds on its downwind side, where the weather station relied on by the commenter is located.
Basically Pattern has discredited my data for the following 3 reasons

1) The distance relationship of anemometers to the tower
2) The height of the anemometer to ground level
3) Sugarloaf mountain distorting the wind or causing a wind break

The weather station relied on by the commenter is located on a large lattice-tower type transmission pole. It appears the anemometer is placed approximately 5 feet from the supporting structure, and is located on the east/northeast side of the tower, and is thus downwind of the tower itself. It has been demonstrated through research and recommended by the International Electrotechnical Commission that anemometers must be placed at least 5 – 7 tower diameters away from the supporting structure to prevent significant wind flow distortion, and should be oriented so the instruments are not downwind of the tower. This deployment criterion is a standard in the wind energy business and ensures proper free stream wind measurements used in financeable wind resource reports.

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Pattern indicates that the height of the weather station I used was not high enough (20 feet) above ground level based on the fact that the hub of the WIND TURBINE GENERATORs would be 260 feet above ground level.

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Pattern states that their wind speeds are measured at 10 meters in height which is equal to 32 feet above ground level. Additionally as they have stated that it’s 260 feet to the hub height and over 400 feet to the blade tip, their wind data is NOT anywhere near the blade sweep area in which they have discredited my data for this very issue.

3.2 Air Resources
Ocotillo Wind Energy Facility

wind speed of 10.7 miles per hour at a 10-meter height and that the wind direction frequency for winds from the southwest and west southwest occur approximately half of the time.
Max Capacity
23,000,000 Watts at 28mph wind speed
(2.3mw)

200,000 Watts at 6.7 - 8.9 mph wind speed.
Cut-in speed (200kw)

Average Wind Speed for Sept. 2010
7.9 mph
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for Oct. 2010
7.6 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for Nov. 2010
7.3 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Average Wind Speed for Dec. 2010
6.4 mph

Max Capacity
23,000,000 Watts at 28mph wind speed
(2.3mw)

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for Jan. 2011
6.4 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for Feb. 2011
7.7 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for Mar. 2011
8.6 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Max Capacity
23,000,000 Watts at 28mph wind speed
(2.3mw)

Average Wind Speed for Apr. 2011
10.8 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for May. 2011
12.2 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
**Max Capacity**
23,000,000 Watts at 28mph wind speed
(2.3mw)

**Average Wind Speed for Jun. 2011**
12.4 mph

**200,000 Watts at 6.7 - 8.9 mph wind speed**
Cut-in speed (200kw)
Max Capacity
23,000,000 Watts at 28mph wind speed
(2.3mw)

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)

Average Wind Speed for Jul. 2011
10.2 mph
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for Aug. 2011
9.3 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Average Wind Speeds for a full year, from Sept. 2010 to Aug. 2011 is 8.9 MPH or 4 m/s
Max Capacity
23,000,000 Watts at 28mph wind speed (2.3mw)

Average Wind Speed for Sep. 2010 to Aug. 2011
8.9 mph

200,000 Watts at 6.7 - 8.9 mph wind speed
Cut-in speed (200kw)
Siemens SWT-2.3-101 Specification data

Operational data
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- 26.8 - 29.1 mph producing 2.3 mw of power

Wind [m/s]

- 0 11.2 22.4 33.6 44.7 mph
Wind Speed Results

My wind speed study
Average Wind Speed for Sep. 2010 to Aug. 2011
8.9 mph

Pattern’s Wind speed study

The project site area, as would be expected for a wind energy project site, is characterized by predominant and strong winds from the southwest and west southwest. Winds from these two directions, as determined by data from Boulevard, located 10 miles west southwest of the project site, occur approximately 53 percent of the time with the average hourly wind speeds of 8.8 miles per hour and 9.1 miles per hour from each direction, respectively (WRCC, 2011). The Applicant also provided over 7,700 hours of wind data collected in 2010 from a monitoring tower at the project site that indicates a median wind speed of 10.7 miles per hour at a 10-meter height and that the wind direction frequency for winds from the southwest and west southwest occur approximately half of the time.

3.2 Air Resources
Ocotillo Wind Energy Facility

Final EIS/EIR
3.2-1
February 2012
Pattern Energy’s Presentation

At the first part of Pattern Energy’s Presentation Pattern says: “Everyone wants to know why we are putting a Wind Energy Project in Ocotillo, Why here?”
Then Pattern energy points to this wind speed map from a distance and says: “It’s right there, that red spot is the Hot-Spot, Class 7 Wind Speeds” Leading everyone to believe the Hot-Spot is in Ocotillo.

The fact is, this Hot-Spot is not in Ocotillo, It’s in Boulder Park near the Rock Tower at over 3,000 feet of elevation.
This is Wind Speed Map is from Pattern’s Presentation

There is a Star located directly in the middle of the “Hot Spot” area which indicates highest Wind Speeds Class 6 – Class 7

There is a note next to the Star saying “Ocotillo Project” Leading us to believe the High winds are in Ocotillo
I decided to research this; I used Google Maps to look at this area to see if there was some way I could locate exactly where this Wind “Hot-Spot” was located in relation to Ocotillo based on the wind speed Map.
I printed out the Google Map onto a clear Transparency
I also printed out the Wind Speed map with a color printer

SOURCE: http://www.windpoweringamerica.gov/images/windmaps/ca_80m.jpg
I overlaid the Google Map clear transparency onto the wind speed map using the Salton Sea and the Mexico boarder line to align both maps so that they would be in the same reference frame.
When I zoomed in on the maps I noticed that the “Hot-Spot” (RED AREA) is actually at Boulder Park and **NOT** at Ocotillo as Pattern has lead everyone to believe.
Why is this significant?
The “Hot-Spot” area at Bolder Park has an average wind speed of 10m/s (Meters per Second) or 20 mph which is **Ideal** for Wind Turbine Generators.

Bolder Park is approximately 10 miles west of Ocotillo at 3,136 feet of elevation.

Ocotillo Elevation = 377 ft
Bolder Park Elevation = **3,136**

Ocotillo shows an average Wind Speed of 5.5 – 6.0m/s which is about 10 – 11mph. Wind Turbine Generators start working at 10mph which means on the average, they will be running on the **Extreme low end of the Duty Cycle Most of the time.**
Wrong Technology
Wrong Place
Bottom Line

Ocotillo does not have winds suitable to Wind Turbine Generators
Thank you.