

Renew New Mexico  
Tucumcari, NM  
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# NACELLE 1 MW



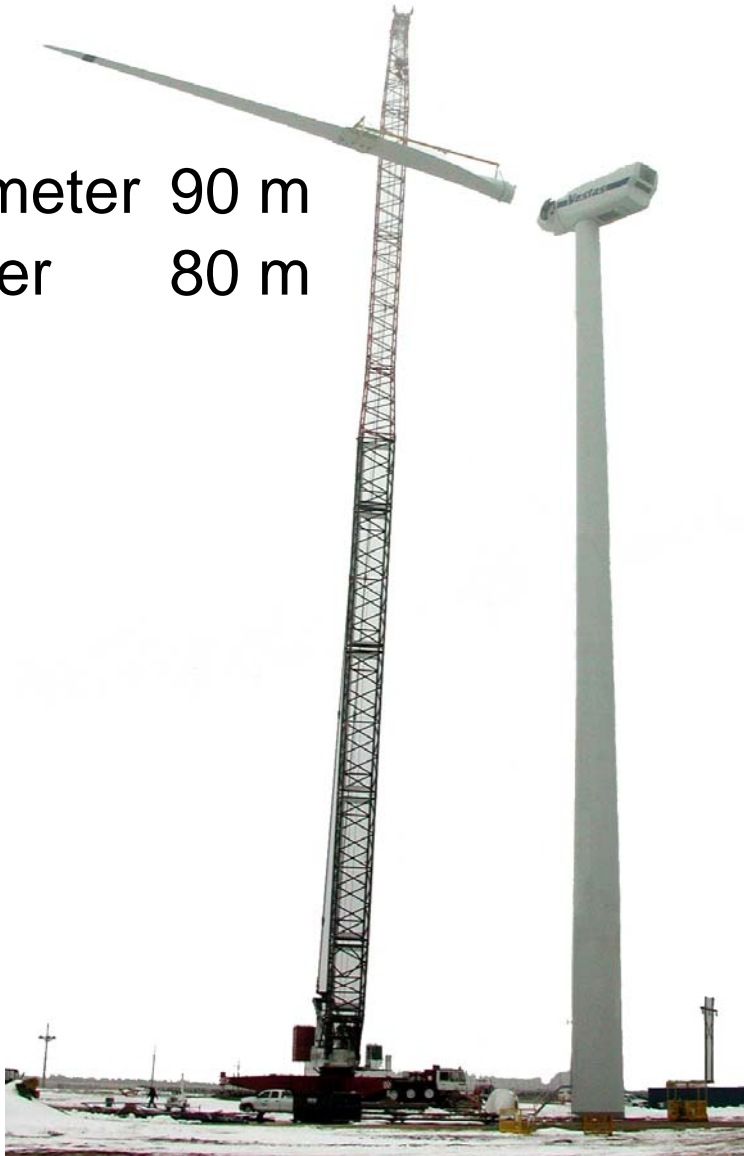
# BLADE 27 m length



ROTOR AREA = 2460 m<sup>2</sup>

# VESTAS V90 3 MW

Diameter 90 m  
Tower 80 m





# WIND FARM DEVELOPMENT

## **MAJOR CONSIDERATIONS**

LAND WITH GOOD WIND RESOURCE

CONTRACT TO SELL ENERGY

ACCESS TO TRANSMISSION

In general, windy lands are not close to major load centers

Steps for Development Available at AEI

# LOCAL ECONOMIC IMPACT

## JOB PER 100 MW

|                             |           |
|-----------------------------|-----------|
| Construction, 4 to 8 Months | 150 - 200 |
| Operation & Maintenance     | 10 - 12   |

## LOCAL PROPERTY TAXES

INDUSTRY - Towers - Repair

# CONTRACTS

LEASE RESOURCE ASSESSMENT 1-3 YRS

FLAT RATE or \$/ACRE PER YEAR

\$0.75 - 1.75/ACRE

ACCESS TO LAND AND INSTALLATION OF  
MET STATIONS

IF OPTION NOT EXCERSIZED, COLLECTED  
DATA BECOMES PROPERTY OF LAND  
OWNER. ESTIMATED VALUE, \$20,000 TO  
25,000 FIRST YEAR

# CONTRACTS

WINDFARM 20 - 30 YEARS,

OPTION FOR EXTENSION

PAYMENT QUARTERLY OR YEAR

- A. ROYALTY ON PRODUCTION, 3 to 5 %  
ESCALATION CLAUSE AFTER ? YRS
- B. PER TURBINE, BASED ON RATED POWER  
\$3,000 to 5,000 per megawatt
- C. A or B, whichever is larger for that year

# PUF INDIAN MESA I

|                                 |   |
|---------------------------------|---|
| Leased Area                     | 2,500 acres                                       |
| Lease Period                    | 30 years  |
| Installation Bonus              | \$2,000/megawatt                                  |
| Royalty Rate                    | 4% years 1-10<br>6% years 11-20<br>8% years 21-30 |
| Minimum Annual:                 | Projected annual income                           |
| Security Deposit                | 2x minimum royalty                                |
| Turbine: 51, Vestas V47, 660 kW |   |
| Option to increase to 60        |   |

# PUF INDIAN MESA I

|                   |                             |
|-------------------|-----------------------------|
| RECs              | Royalty paid if valued      |
| Removal Bond      | Mutual Agreement            |
| Hunting           | Prohibited for 1 year       |
| University Audits | Independent outside auditor |
| Meter Calibration | Required every 3 years      |
| Curtailment       | Shared by all landowners    |

# LEVELIZED COST OF ENERGY

$$\text{COE} = \frac{(\text{FCR} * \text{ICC}) + \text{LRC} + \text{AOM}}{\text{AEP}}$$

COE = LEVELIZED COST OF ENERGY, \$/kWh

FCR = FIXED CHARGE RATE, per year

ICC = INITIAL CAPITAL COST, \$

LRC = LEVELIZED REPLACEMENT COST, \$/yr

AEP = NET ANNUAL ENERGY PRODUCTION, kWh/yr

AOM = ANNUAL OPERATION & MAINTENANCE, \$/kWh

# COE EXAMPLE, 2008

50 MW WIND FARM, 2.3 MW TURBINE

$$\text{FCR} = 8\% = 0.08$$

$$\text{ICC} = \$2,000/\text{kW} = \$4,600,000/\text{Turbine}$$

$$\text{LRC} = \$46,000$$

$$\text{AOM} = \$7.5/\text{MWh} \quad \text{availability} \quad \text{elevation}$$

$$\text{AEP} = 7,500 \text{ MWh} \quad 98\% \quad 1000 \text{ m}$$

$$\text{COE} = \frac{(0.08 * 4,600,000) + 46,000}{7,500} + 7.5$$

$$\text{COE} = \$ 63 / \text{MWh}$$

# \$63/Megawatt-hour !!!

But the Utility wants to only pay you \$40

What makes up the difference ??

PTC ( \$20/MWh for 10 yrs)

DDB (Accelerated Dep) (\$15 – 20/MWh)

NM REC \$10/MWh

Total Value ( 40 + 20 + 20 + 10 = \$90 )

# DRIVERS

Renewable Portfolio Standards  
Federal Production Tax Credits

# SPEED BUMPS

Access to Transmission Lines  
Load Centers Distance from Windy Lands

# FUTURE

Pollution / Emission Credits  
Distributed and Cooperative Wind Plants  
Hedge, Natural Gas Price Volatility



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