On-Farm Wind Power

Presenter – David Specca
Assistant Director, Rutgers EcoComplex
Farms have long relied on wind power for some energy needs
NJ’s major wind resources are along the Atlantic Coastline and Delaware Bay. Some Class 2 and 3 winds do exist inland.
Effects of Wind Turbulence

Obstruction of the Wind by a Building or Tree of Height (H)

Region of highly turbulent flow

2H

H

20H

National Renewable Energy Labs
Understanding “wind rose” data

• A WIND ROSE GIVES INFORMATION ABOUT THE WIND SPEED AND FREQUENCY OF WIND BLOWING FROM VARIOUS DIRECTIONS.

• THE LENGTH OF EACH “SPOKE” AROUND THE CIRCLE IS RELATED TO THE FREQUENCY OF TIME THAT THE WIND BLOWS FROM A PARTICULAR DIRECTION.

• EACH CONCENTRIC CIRCLE REPRESENTS A DIFFERENT FREQUENCY FROM ZERO AT THE CENTER TO INCREASING FREQUENCIES AT THE OUTER CIRCLES.

• YOU CAN ANALYZE A WIND ROSE TO DETERMINE THE PREVAILING WIND DIRECTION AND FREQUENCY

Skylands Renewable Energy, LLC
Siting Considerations

• Each Potential Site Is Unique
• Local Conditions are Very Important
• Towers And Equipment Must Fit Each Situation
• Not All Locations Are Suitable
• Local Zoning Codes
• Proximity to Electrical Interconnection
• Proper Wind Site Assessment Is The Single Most Critical Element In The Entire Process - It Sets The Stage For All Subsequent Decisions
15kW Rated Turbine

- Estimated Annual Production = 20,806 kWh’s
  - Assumes 12 Mph Annual Wind Speed
  - 120’ Tower
  - 600’ Elevation
  - Cleared And Forested Land W/Occasional Buildings

- Estimated Installed Cost: $105,000
- Estimated NJ CORE Program Farm Rebate: $53,603
- USDA Section 9006 Grant: $26,250
- 2009 Federal Stimulus Bill Tax Credit/Grant: $8,299
- Net Cost Of Project: $16,845
- Estimated Current Annual Electric Savings: $4,609
@ .16/kWh Delivered Cost
- Years To “Breakeven” Point: 3.65 years

Skylands Renewable Energy, LLC
50kW Rated Turbine

- Estimated Annual Production = 94,959 kWh's
- Assumes 12 Mph Annual Wind Speed
- 120’ Tower
- 600’ Elevation
- Cleared And Forested Land W/Occasional Buildings

- Estimated Installed Cost $375,000
- Estimated NJ CORE Program Farm Rebate $90,680
- USDA Section 9006 Grant $93,750
- 2009 Federal Stimulus Bill Tax Credit/Grant $57,171
- Net Cost Of Project $133,399
- Estimated Current Annual Electric Savings $15,193 @ .16/kWh Delivered Cost
- Years To “Breakeven” Point 8.79 years

Skylands Renewable Energy, LLC
Thank You!

Special Thanks to Roger Dixon, Certified Wind Site Assessor, Skylands Renewable Energy, LLC 908-337-2057

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