



Byers Auto Group: A Case Study Into The Economics, Zoning, And Overall Process Of Installing Small Wind Turbines At Two Automotive Dealerships In Ohio



15kW Proven; Byers Group Toyota Dealership in Delaware OH. Photo from Byers and Renier Construction, NREL/PIX 18222

Solar 2011

Karin Sinclair, NREL

Frank Oteri, NREL

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Outline

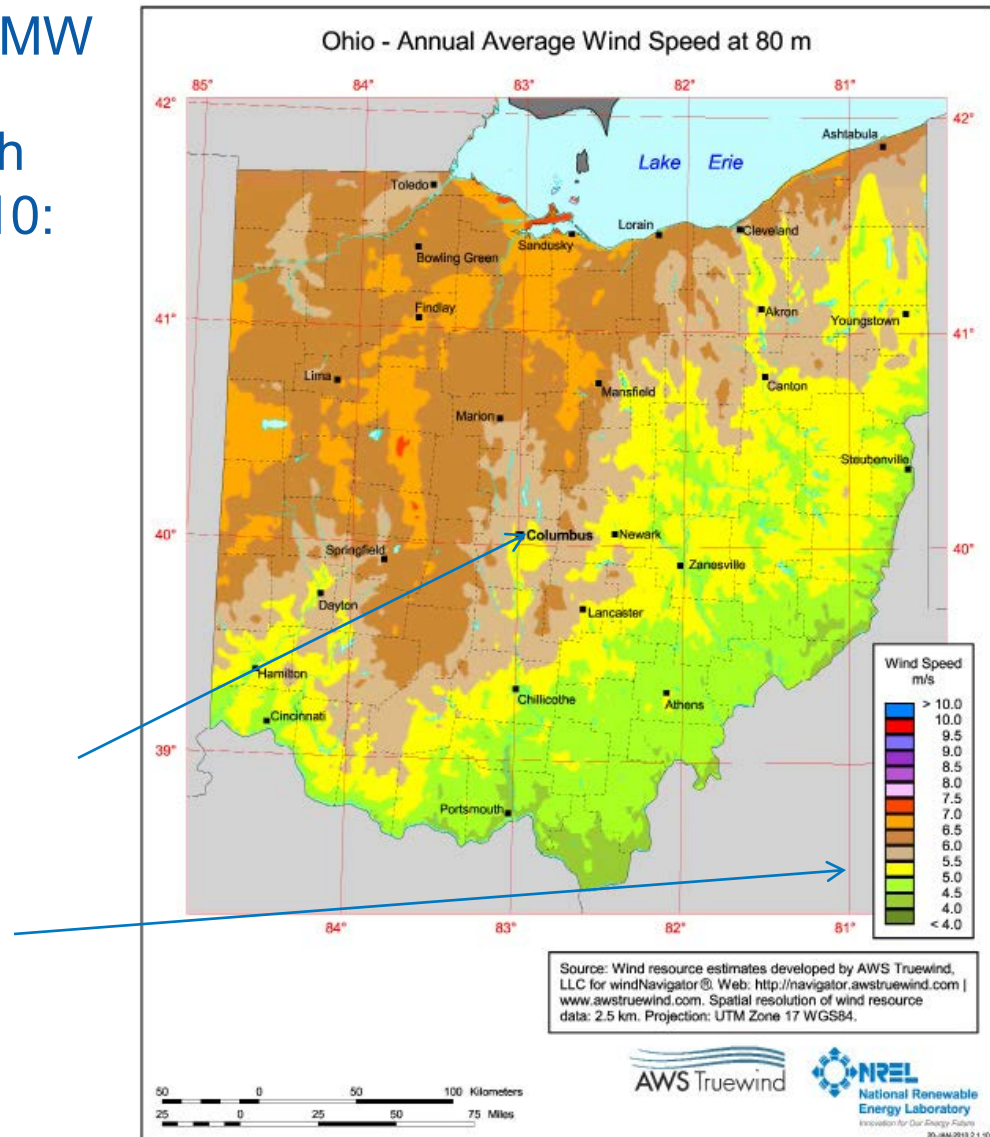
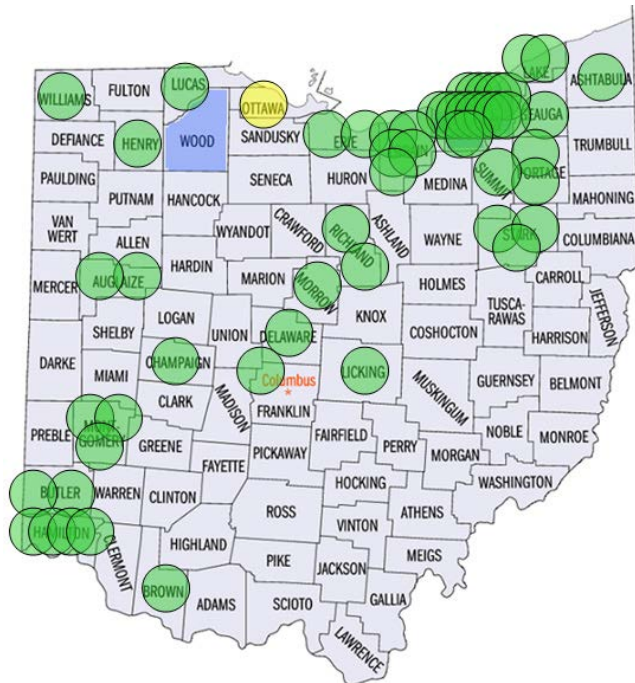
- Introduction
- Factors Influencing Turbine and Site Selection
- Zoning and Permitting Process
- Installation and Maintenance
- Financials
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- Conclusions



Northwind 100kW; Byers Group Mazda/Subaru Dealership in Columbus OH.
Photo from Byers and Renier Construction, NREL/PIX 18221

Ohio Wind Resource/Capacity Installed

- ❑ Available wind resource: 54,920 MW (onshore at 80 meters)
- ❑ State wind resource ranking: 18th
- ❑ Capacity online at the end of 2010: 11 MW
- ❑ Added in 2010: 3 MW
- ❑ Under construction: 304 MW
- ❑ Projects in queue: 3,683 MW



Source: AWEA

Introduction

- ❑ Byers Group is 5th generation; began transportation business in 1897
- ❑ Pride themselves as having history of being early adopters; view themselves as forward thinkers
 - Had the first air conditioned dealership in the country
- ❑ Building new Toyota dealership in Delaware, OH (2008)
- ❑ Seeking ideas for product differentiation
 - Green approach/Toyota provides some guidance
 - Initially considering recycled tiles, high efficiency lighting and HVAC
 - Uncle saw small operating turbine while driving; brought idea to Group for consideration
 - Considered other renewable options; due to cost, visibility and electricity production ultimately decided on wind
- ❑ Original focus was one turbine/one site

Factors Influencing Turbine and Site Selection

- ❑ Reliability/Proven Operations
 - Difficulty selection process
 - Contacted others to gauge satisfaction (weeded out some non-performers)
- ❑ Wind Resource
 - Renier: used wind maps; resource at Delaware not adequate for NW100; stronger winds at Columbus site
- ❑ Visibility
 - Can be seen from the road; brings in visitors
- ❑ Local Regulations
 - Delaware officials not comfortable with 150' tower; too close to busy road
 - Original approval was 52'; amended to 82'
- ❑ Production
 - Used manufacturer's power output with wind estimates to calculate est production
- ❑ Cost



Installation of 100kW, 15kW Northwind Turbine at Byers Automotive Group in Columbus OH, Renier Construction builder. Photo from Byers and Renier Construction, NREL/PIX 18820

Zoning and Permitting Process

- ❑ 2 locations = 2 jurisdictions with differing regulations
 - No wind specific rules for either
 - Delaware – Planning Commission presentation for approval
 - Columbus – Use existing cell tower language
- ❑ Renier Construction and Architectural Alliance secured all building permits for project
 - Communicated directly with city officials, resulting in a smoother process



Photo from Byers and Renier Construction, NREL/PIX 18813

Installation and Maintenance

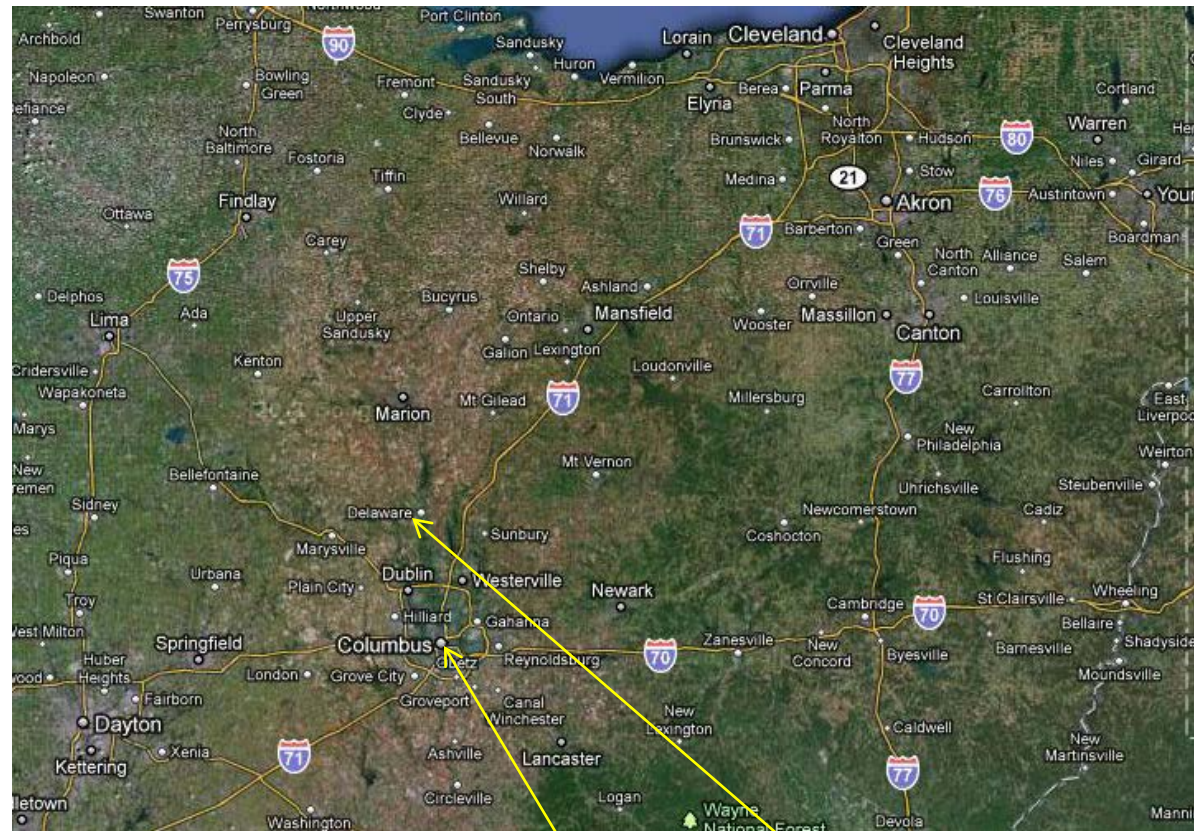
- ❑ Construction done by TCT Erectors
 - Previous experience installing Provens; went to NW to get training to be certified installer and to provide maintenance
 - NW construction began Sept. 2010; dedicated Oct. 22, 2010
 - Proven construction began Oct. 2010; dedicated Nov. 2010
 - Both turbine manufacturers provide 5-yr. parts warranty
 - Byers is finalizing 5-yr. maintenance contracts



Photo from Byers and Renier Construction, NREL/PIX 18814

Relative locations of dealerships

Became 2
turbines at 2
different
dealerships:
NW100
Columbus and
Proven 15kW
at Delaware



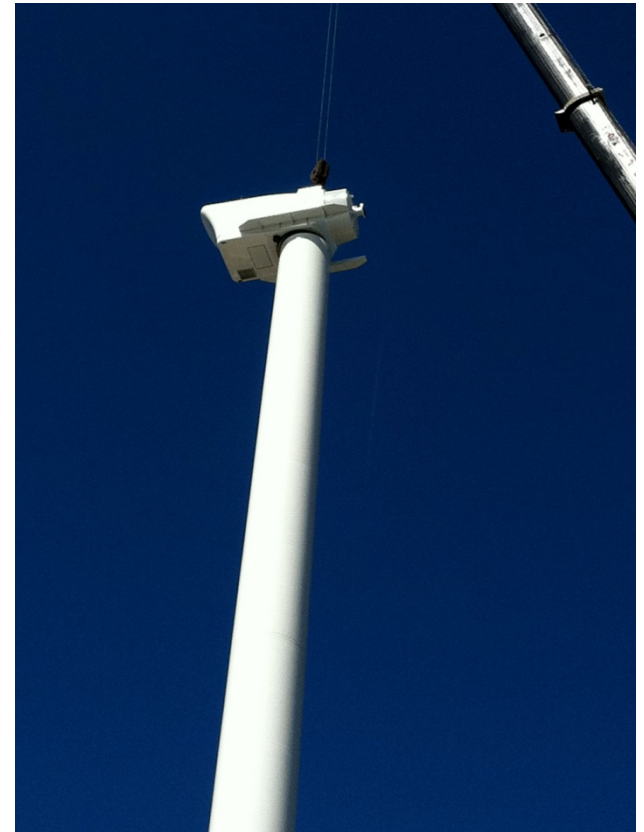
Aerial image of OH depicting relative location of Columbus and Delaware

Comparison Statistics

	Byers Toyota	Byers Mazda/Subaru
Location	Delaware Co, OH	Columbus, OH
Permitting agency	City Planning Commission	Building Department
Turbine	Proven 15kW	Northwind 100
Tower height	82'	150'
Installation date	October 2010	September 2010
Avg est wind speed	9.2 mph	12 – 13 mph
Cut-in wind speed	5 mph	7 mph
AEP (est)	25,000 Wh/yr	150,000 Wh/yr
% energy met	5 – 10%	15 – 20%

Financials

- ❑ Total project cost = ~\$600,000
 - Group received Ohio Department of Development Grant for \$200,000
 - Took advantage of Section 1603 of the Federal Tax Code (30% of total), providing almost 1/3 of total project cost in the form of a line item tax credit (\$180k)
 - Cost Group ~\$220,000
 - NW energy offset: 15 – 20%
 - Proven energy offset: 5 – 10%
 - Estimated payback for project 3 – 5 yrs



Installation of 100kW, 15kW Northwind Turbine at Byers Automotive Group in Columbus OH, Renier Construction builder. *Photo from Byers and Renier Construction, NREL/PIX 18819*

Interest

- ❑ Group received media attention throughout construction process
 - Peak press = ~ 5 times/week.
 - No data explicitly collected to quantify vehicle sales directly related to customer interest in turbines



Installation of 100kW, 15KW Northwind Turbine at Byers Automotive Group in Columbus OH, Renier Construction builder. *Photo from Byers and Renier Construction, NREL/PIX 18815*

Conclusions

- ❑ 2-yr. process shows that wind turbines can work in OH
- ❑ Byers' experience now can serve to educate and inform public on viability of wind
 - Turbines will be used for local schools to visit for educational purposes
 - Educational displays: RPM, wind speed, production (10-day, month timeframe)
 - NW will also be included in Ohio's 2011 Solar Tour



Installation of 100kW, 15KW Northwind Turbine at Byers Automotive Group in Columbus OH, Renier Construction builder. Photo from Byers and Renier Construction, NREL/PIX 18821

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