

# Wind Power in Tompkins County: A Technical and Regulatory Assessment

**PREPARED FOR TOMPKINS COUNTY**

**BENJAMIN J. KOFFEL**

**APRIL 30<sup>TH</sup>, 2012**

# Quantifying Wind Potential



**Electricity from Wind** = **Suitable Land Area** + **Energy Produced at Each Site**



**Method of Analysis**

=

**Geographic Information Systems (GIS)**

+

**Wind speed distribution models**

# Large Wind: Choosing Sites



## Siting Considerations

### Developer Preferences

- Wind speed considerations
- Financial considerations
- Construction Challenges

### Municipal Concerns

- Environmental Protection
- Cultural resource protection
- Avian Populations
- Abutter protection
- Public Safety



## Model Parameters

### Weighted Variables

- Wind Speed
- Slope
- Proximity to Transmission Line
- Land Use

### Prohibited Areas

- Property line setbacks
- Critical Environmental Areas
- Airports
- Important Bird Areas
- Scenic Viewsheds



# Large Wind: Results



Most Suitable Parcels for Large-Scale Wind  
Tompkins County, NY

## Enfield

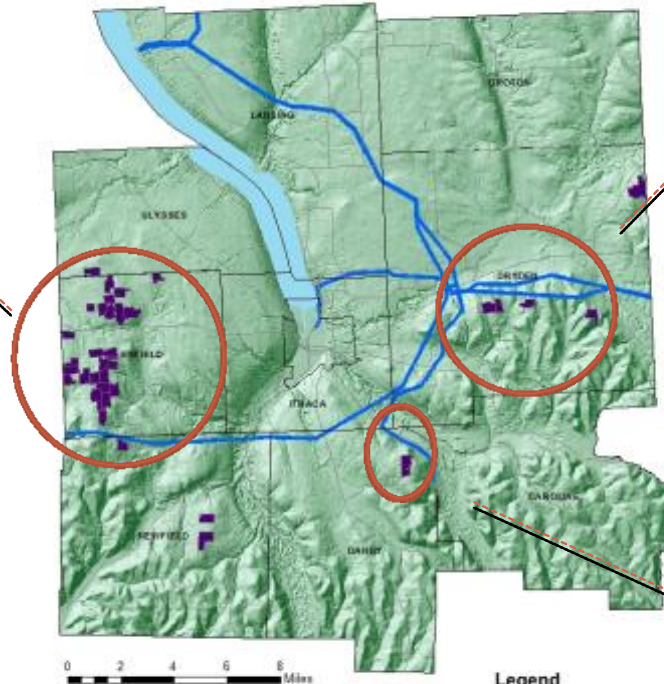
- Parcels: 25
- Technical Potential: 35MW
- Likelihood of Development: High (currently under development)

## Dryden

- Parcels: 3
- Technical Potential: 7MW
- Likelihood of Development: Low

## Danby

- Parcels: 1
- Technical Potential: 5MW
- Likelihood of Development: Low



Map Author: Ben Kettel  
Date: March, 2012  
Source: COGIR, Tompkins County Planning Department, Finger Lakes Land Trust, AMS Truwind  
Projection: NYS State Plane  
Raster Resolution: 25m

## Total Output

- **~40MW** installed capacity
- Electricity for up to **30%** of county

# Large Wind: Potential Vs. Reality



- **Financial returns**
  - Wind resource in Tompkins County is low, revenues might not meet hurdle rate for investors
- **Local Regulations**
  - Dryden limits development to under 10kW installed capacity

# Small Wind: Choosing Parcels



Property-Line Setbacks



Protected Areas

- Public open space
- Critical Environmental Areas
- Important Bird Areas
- Unique Natural Areas
- Airport



Appropriate Slope



Sufficient Wind Speed



2,100 Residential parcels

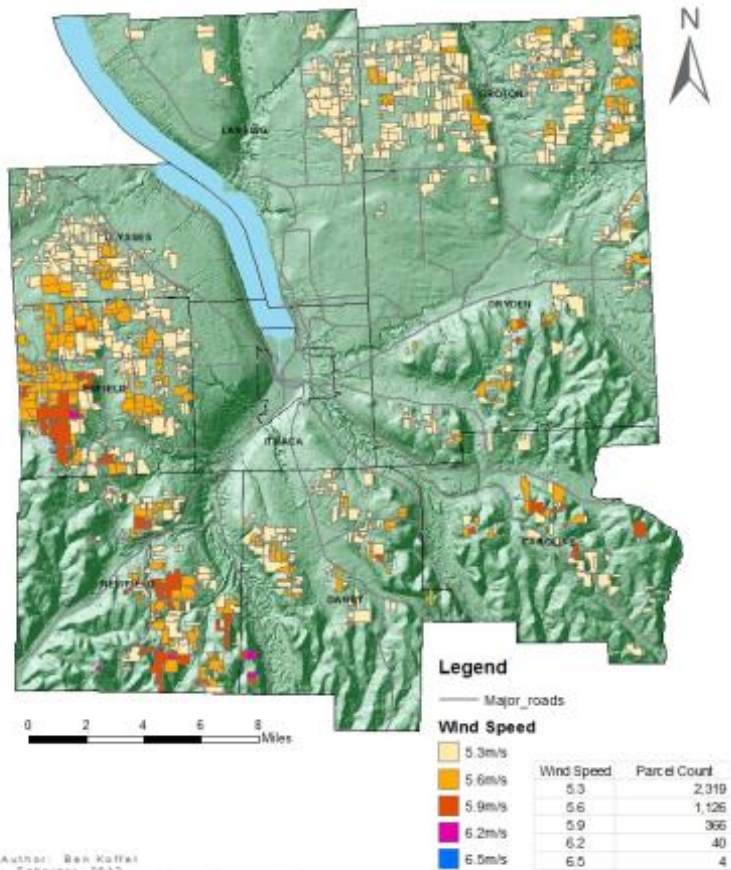
1,600 Agricultural parcels

Wind speeds range from 5.25m/s-6.6m/s

38MW installed capacity

# Small Wind: Most Potential to Go Unrealized

Most Suitable Parcels for Small-Scale Wind  
Tompkins County, NY



Map Author: Ben Koffel  
Date: February, 2012  
Source: CUBR, Tompkins County Planning Department,  
Finger Lakes Land Trust, AWS Truewind  
Projection: NYS State Plane

Wind Speed	Parcel Count	Potential Installed Capacity	Household electricity provided by wind
5.3 m/s	2,319	23MW	32%
5.6 m/s	1,126	11MW	43%
5.9 m/s	366	3.6MW	57%
6.2 m/s	40	.4MW	74%
6.5 m/s	4	.04MW	100%
<b>Total</b>	<b>3,855</b>	<b>38.55MW</b>	

- **Largest Barrier: Cost**
  - Wind turbines are a large investment
  - Wind may not be cost-competitive with solar
  - Most suitable parcels have low wind speeds

# Medium-Scale Wind: Specialized Application



- **Parcels with large on-site demand**
  - Large farms (particularly dairy farms)
  - Schools
  - Hospitals
  - Other institutions
- **Greater cost, but greater generation potential**



# Regulatory Environment: State



- **Over 25MW: Article X**
  - Centralizes authority at state level
  - Facilities permitted through 7-member siting board
  - Streamlines SEQR by replacing many agencies with one agency
- **Under 25MW: SEQR**
  - Municipality retains final authority over project approval
  - Local government acts as lead agency on a multi-agency review
  - Process can be amorphous and difficult to navigate

# Survey of Town Permitting and Zoning



- **No regulation: Caroline, Danby, Ulysses, Newfield**
  - Makes no mention of wind turbines in municipal code; some towns do not have zoning
- **Capacity regulation: Dryden, Groton**
  - Restricts installed capacity
- **Land-use regulation: Ithaca, Lansing, Enfield**
  - States provisions for wind turbines in town zoning, outline setbacks and permitting procedures

# Impact of Non-Comprehensive Local Regulations



## Increased cost to homeowners

- Height restrictions reduce revenue potential
- Complex permitting structures are burdensome and raise costs for installers

## Increased transaction costs to town

- Without existing provisions, each turbine application is a new challenge for the town
- No efficiency gains

## Reduced Morale

- Projects take long to develop, interest can wane
- One poor experience spreads to other interested community members

### Small Turbines in Tompkins County

Tower height	kW	Installed
120	2.5	2/8/07
100	10	8/4/04
80	1	9/6/06
80	10	7/11/05
120	2.5	2/1/07

Thank You

**QUESTIONS AND COMMENTS**