



Public power partners  
*Since 1971*



*Wind Development  
Experience in Ohio and  
Pennsylvania*

## Introduction to American Municipal Power, Inc.

- Member-owned/governed non-profit corporation formed in 1971 (formerly AMP-Ohio)
- Wholesale power supplier and services provider for 128 municipal electric systems in 6 states – Kentucky, Michigan, Ohio, Pennsylvania, Virginia, and West Virginia
- Owns/operates electric generating facilities (fossil, hydro, wind, LFG, distributed generation)
- Develops, manages and coordinates wholesale power supply and interconnection agreements for members
- Provides various services to members: finance, project engineering, environmental, safety, training, communications, legislative & regulatory analysis, etc.

## Introduction to American Municipal Power, Inc.

- AMP members serve more than 570,000 customers/meters
- AMP members located in footprints of both MISO and PJM regional transmission organizations

## Project Development at AMP

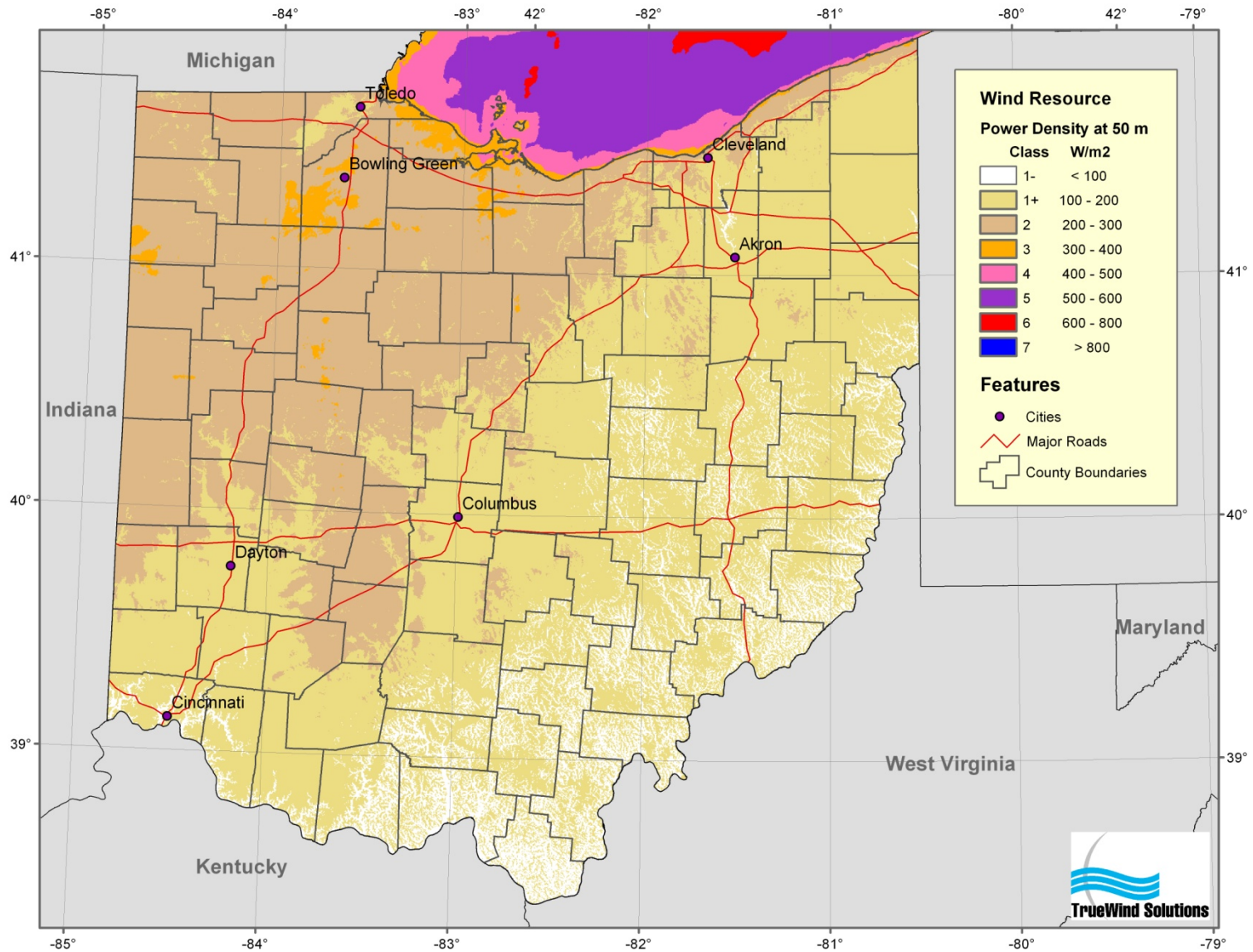
- AMP members decide in which projects to be involved; participation in any project is not mandatory
- Generation projects are subscribed prior to construction
- One size does not fit all – a variety of project development / ownership approaches are used:
  - AMP owned and operated
  - Joint ventures among various members (member owned / AMP operated)
  - Individual member owned, AMP supported
  - PPA (AMP financing)

## AMP Wind Projects

- AMP / OMEGA JV6 Wind Farm – Bowling Green, OH
  - Originally a partnership with Green Mountain Energy Company (GMEC)
  - 7.2 MW
  - Operating since 2003 (added second two turbines in 2004)
- Berlin Wind Farm (Berlin, PA)
  - 5.4 MW
  - Currently under development
- Other locations under consideration

**American Municipal Power / OMEGA JV6 Wind Farm  
Wood County, Ohio  
Ohio's First Commercial Wind Generation Site**





## Initial Monitoring



- City of Bowling Green worked with Green Energy Ohio (GEO) to install a 50 meter wind monitoring tower
- Collected 16 months of data (1999-2000) to demonstrate project was feasible from a wind availability perspective with simple average wind speeds of 13 mph

## Creating the Partnership

- Bowling Green and AMP-Ohio worked with the Wood County Commissioners and the Solid Waste Authority for a lease agreement for land near the landfill
- Site to accommodate four units
- Units were construction in two phases with first two units going on line November 2003 and second two units on line November 2004
- Permitting received from F.A.A. and from local entities
- AMP-Ohio arranged financing to move forward with construction of first two units with Bowling Green committing to purchase output
- Ownership transferred to Ohio Municipal Electric Generation Agency Joint Venture 6 (OMEGA JV6)

## Project Partners

- AMP (then AMP-Ohio)
- Green Mountain Energy Company (GMEC)
- OMEGA JV6 Participants:
  - Bowling Green - Cuyahoga Falls
  - Edgerton - Elmore
  - Monroeville - Montpelier
  - Napoleon - Oberlin
  - Pioneer - Wadsworth
- Wood County







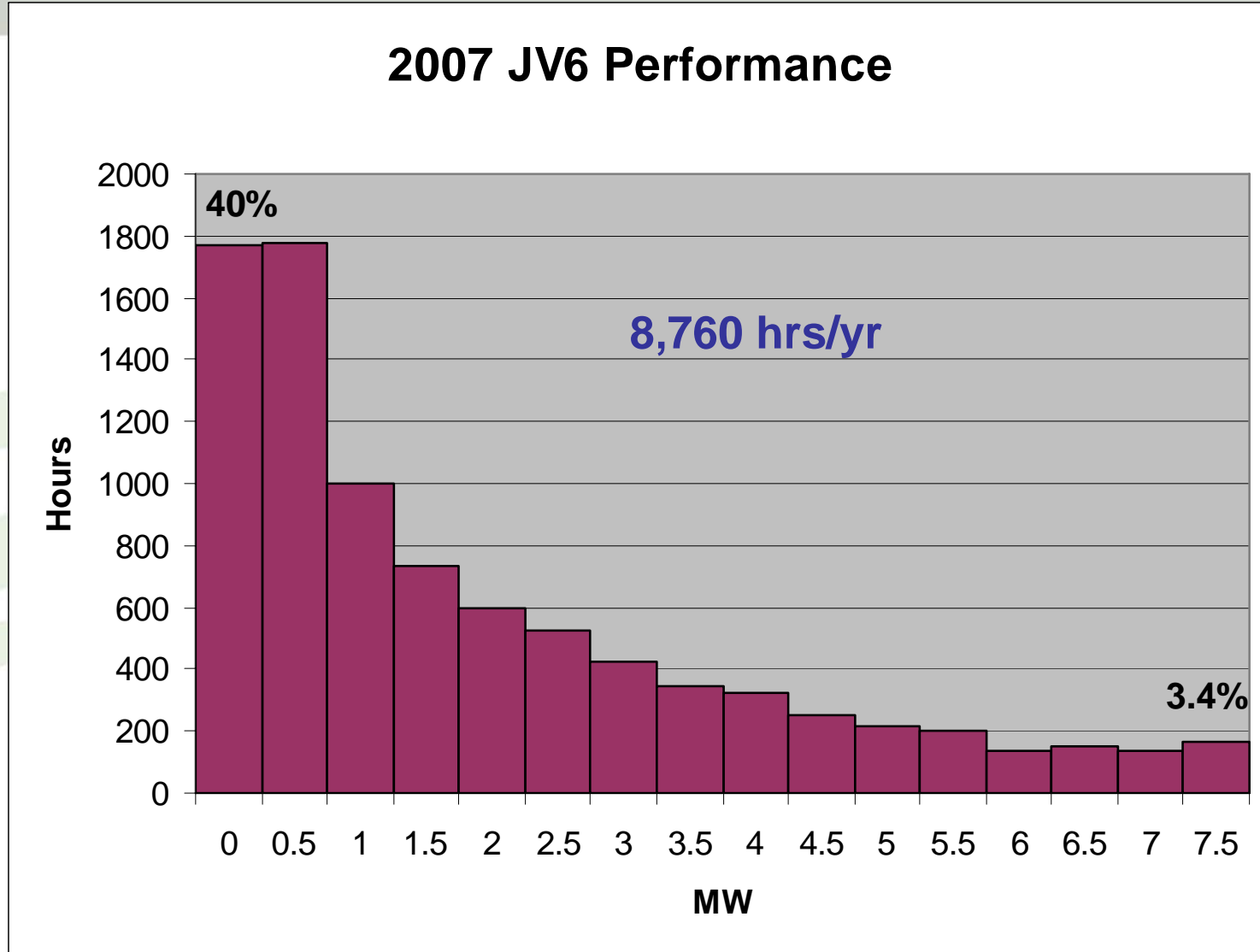
## OMEGA JV6 Operational Characteristics

- Vestas units operate at wind speeds between 8.9 mph – 55.9 mph
- Can withstand wind speeds of 133.1 mph
  - At a wind speed of 31.3 mph, generator will be at full capacity
  - Site has 23% wind availability
  - Nominal rotation speed will be 16.8 rpm
- Tied to the Bowling Green utility grid
- Operating history
  - Gearbox replacement
  - Lightening damage to blades

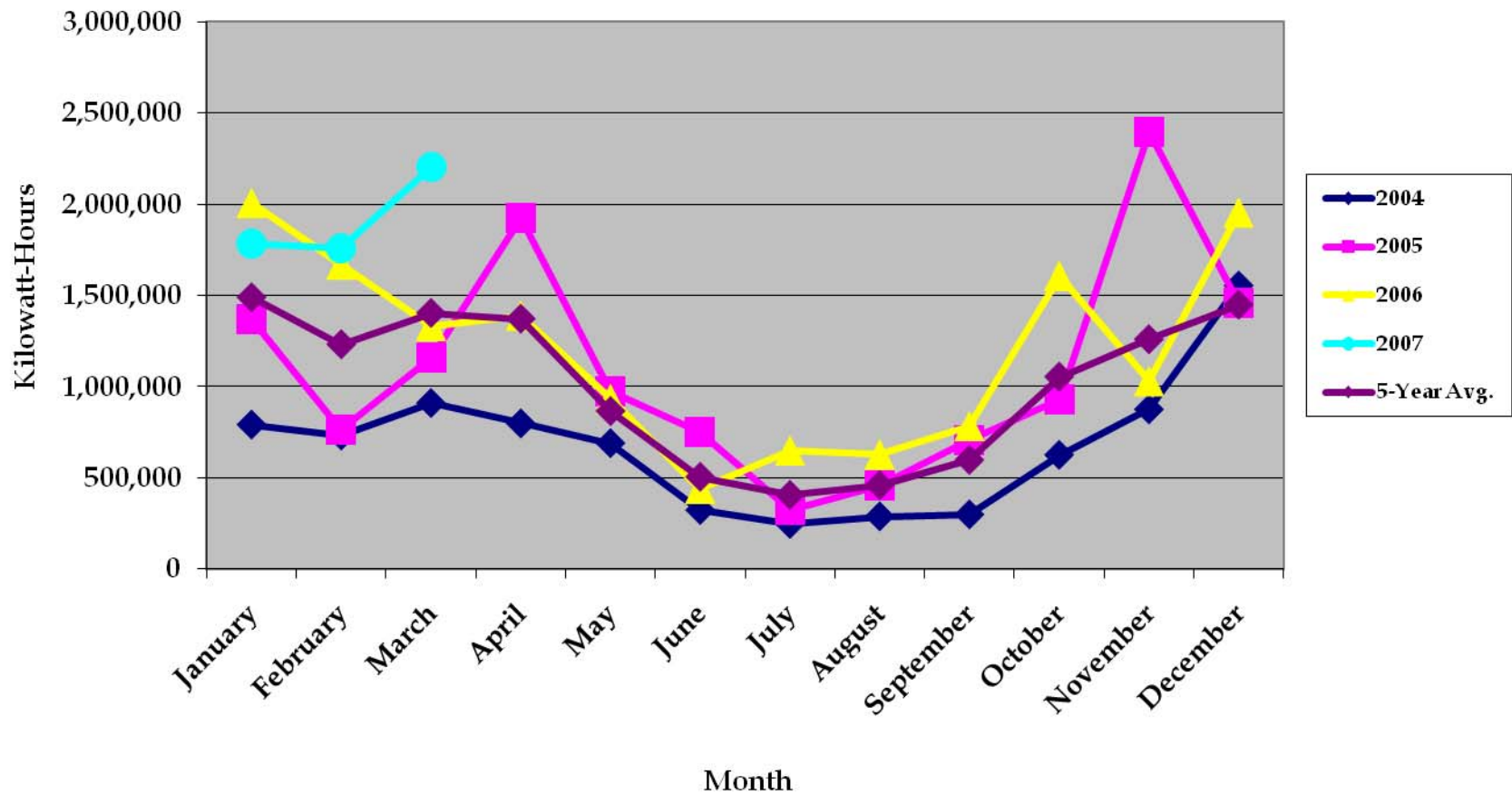
## Generation at OMEGA JV6

- $7.2 \text{ MW} \times 24 \text{ hrs/day} = 173 \text{ MWh/day}$
- $173 \text{ MWh} \times 365 \text{ days/yr.} = 63,145 \text{ MWh/yr.}$
- $63,145 \text{ MWh} \times 0.95 \text{ (unit avail.)} = 59,988 \text{ MWh/yr.}$
- $59,988 \text{ MWh} \times 0.23 \text{ (wind avail.)} = 13,797 \text{ MWh/yr.}$

## 2007 JV6 Performance



## OMEGA JV 6 Wind Project



## Making it Work

- Total project cost \$10 million financed for 15 years
- Participants pay monthly demand charge
- No fuel cost or energy charge
- Five-year agreement with GMEC for sale of RECs from the project (expired Dec. 2008)
- Revenue from sale of RECs to GMEC exceeded annual operating and maintenance expenses

## Making it Work

- Collaboration between AMP-Ohio, member communities including City of Bowling Green, Wood County officials, Green Energy Ohio, Green Mountain Energy Company
- GMEC purchased the RECs at above market rates
- AMP-Ohio's experience in financing and access to affordable financing
- Availability of land

## Berlin Wind Project

### Currently Under Development :

- 5.4 MW (being designed for 3 turbines)
- Borough of Berlin, Pennsylvania (Somerset Co.)
- Borough-owned site, forested ridge top, 4.5 mi east of Borough
- Project is within view of 3 other wind projects of 5-20 turbines each
- Projected capacity factor 32-35%

## Berlin Siting Considerations to Date

- Turbine locations moved west 300 ft to avoid adjacent township and restrictive property setback restrictions
- Project site avoids wetlands, high quality surface waters, and sensitive ecological features
- AMP entered into a voluntary cooperative agreement with the PA Game Commission to collect and share pre- and post- construction population survey data for bats, breeding birds, and raptors

## Berlin Permitting

- Permits required from the PADEP (General Permit), Somerset Co. (Erosion Control), and Borough of Berlin (building department)
- The discovery of an Indiana Bat hibernacula in an abandoned railroad tunnel 3.5 miles NE of project site after project started resulted in requirement for additional bat monitoring and application to obtain a Incidental Take Permit (ITP) from the USF&W Service. This delays COD for 18 months.

## Wind Projects Under Consideration

- **North central Ohio**

  - 1 yr+ wind data collected to date

  - Site could support up to 100 MW wind farm

  - Projected Capacity Factor – 27%

- **Projects with private developers (joint venture or PPA arrangements)**

## Developmental Considerations for WIND

- Strength of wind resource
- Interconnection options
- Location diversification
  - Offsetting wind patterns
  - LMP / congestion considerations
- Member interest
- Environmental and other siting issues
- Financial viability of project – including RECs
- Potential partnerships

## Siting Issues

- Not In My Backyard (NIMBY)-ism occurs with all types of generating facilities
- “BANANA”: Build Absolutely Nothing Anywhere Near Anything
- Siting transmission is also difficult - Interconnection can be complicated
- New wind project siting rules (2009) in Ohio are untested
- New challenges to wind – especially environmental

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