Community Wind Project Development

Melissa Peterson
Windustry Program Analyst
Feb 10th, 2009
Pre-Conference Workshop-CERTS
Community Based Energy Development

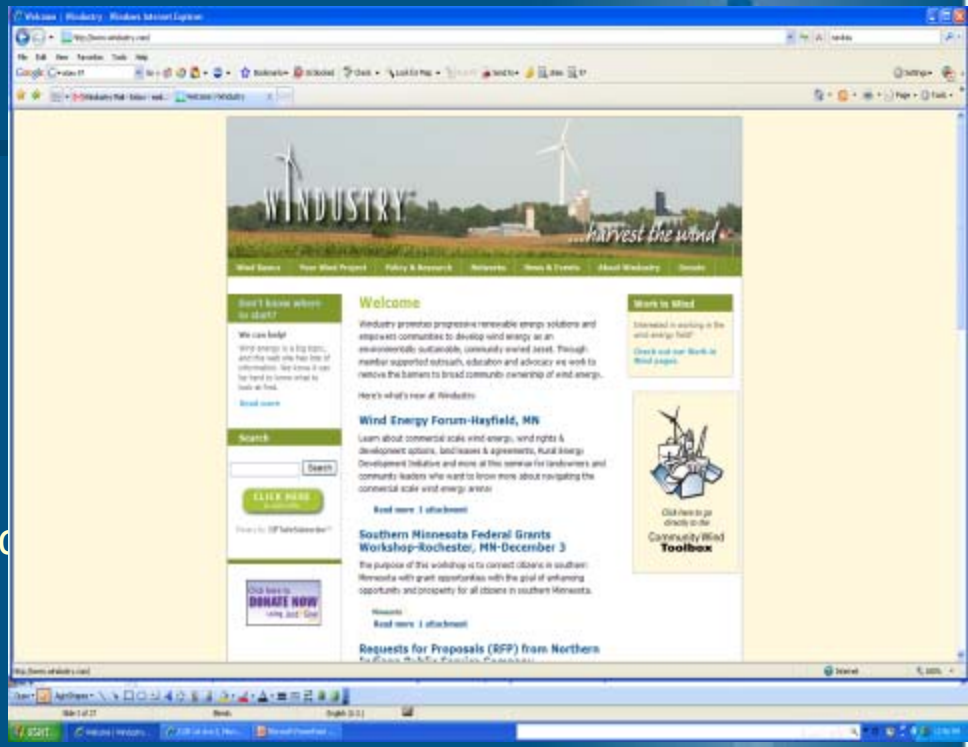
Outline

- About Windustry
- What is Community Wind? And why?
- Community Development Overview
- Steps for a Community Wind Project
  - Project Planning and Management
  - Wind Resource Assessment
  - Siting and Permitting
  - Leases/Easements
  - Financing
  - PPA
  - Interconnection
  - Construction
- Community Wind Resources

WINDUSTRY™

Windustry

- Non-profit organization based in Minneapolis, MN - work locally, regionally and nationally
- www.windustry.org
- Focus on community wind, landowner options, and rural economic development
- Provide landowner education, outreach and technical assistance
- Tailor our efforts for agricultural organizations, rural landowners & communities and local elected officials



Mission Statement:

"Windustry promotes progressive renewable energy solutions and empowers communities to develop wind energy as an environmentally sustainable, community-owned asset. Through member supported outreach, education and advocacy we work to remove the barriers to broad community ownership of wind energy."

WINDUSTRY™

What is Community Wind?

Locally-owned, commercial-scale wind projects that optimize local benefits. Locally-owned means that one or more members of the local community has a significant direct financial stake in the project other than through land lease payments, tax revenue, or other payments in lieu of taxes. The term "community wind" refers to the method and intention of development rather than the size of the project.

WINDUSTRY™

Benefits of Community Wind

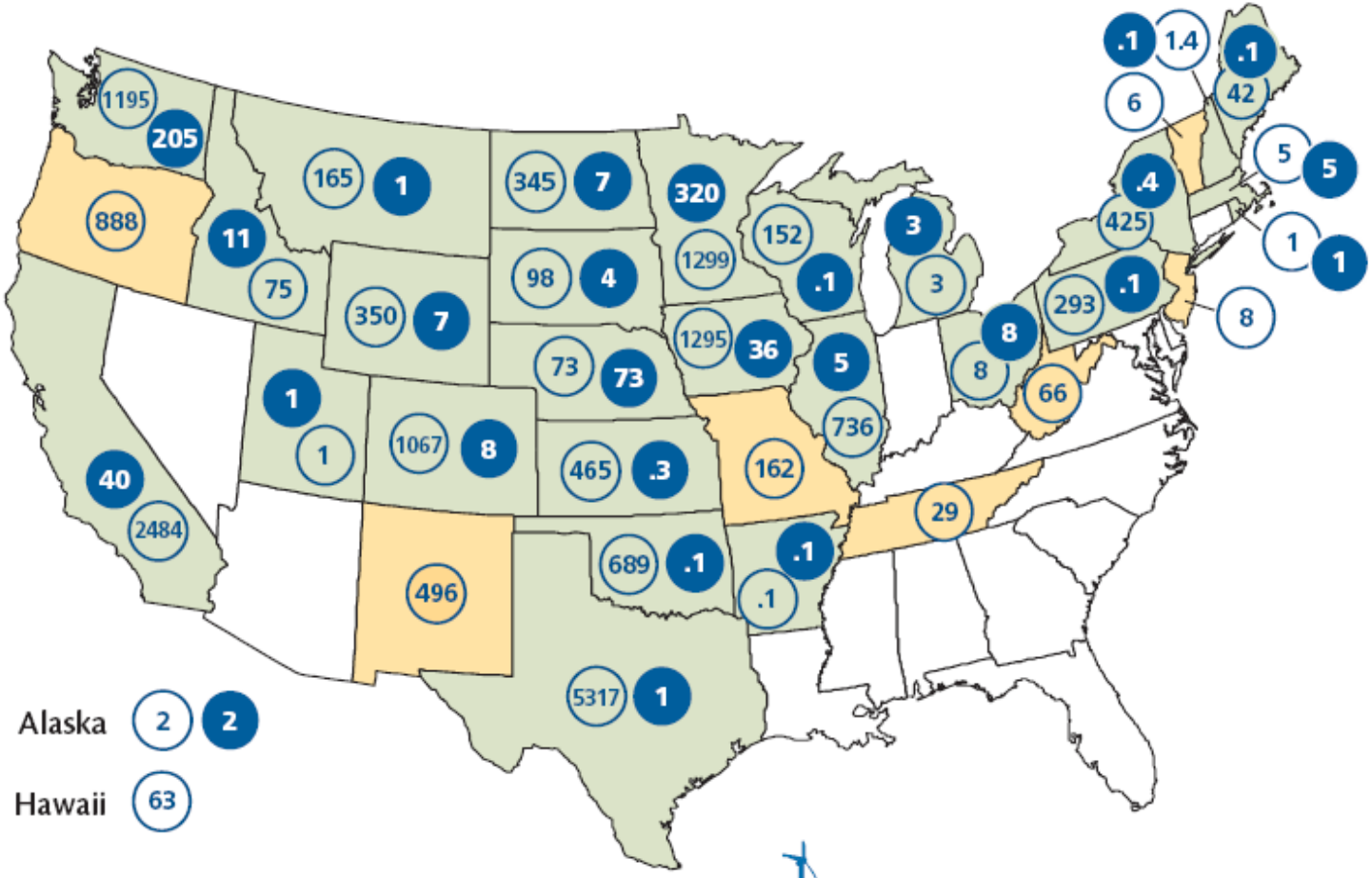
- **Economic Benefits**
  - Revitalizes Rural Economies & Stimulates the local economy
  - Stabilizes Energy Prices
  - Creates Jobs
- **Environmental Benefits**
  - Produces Clean Electricity.
  - Keeps Water Sources Clean
  - Protects Natural Resources
  - Preserves Land
- **Social Benefits**
  - Promotes Energy Independence and National Security
  - Creates a New Crop
  - Promotes Local Ownership
  - Galvanizes Support and Neutralizes Opposition

"Community wind helps get people connected to their energy use. Local energy production helps to build a better society, a better culture, and a better planet."

--David Benson, Nobles County Commissioner & Farmer

WINDUSTRY™

Installed Community Wind and Wind Capacity in the U.S.



WINDUSTRY

Community Wind States

Wind Farm Only States

275 Community Wind (MW)

895 Total Wind Capacity (MW)

18,281 MW of Wind Installed in the U.S.

736 MW is Community-Owned

July 2008

Spectrum of Community Wind

Community Ownership

- Groups of Local landowners / investors
- Private Schools
- Public / Private Partnerships

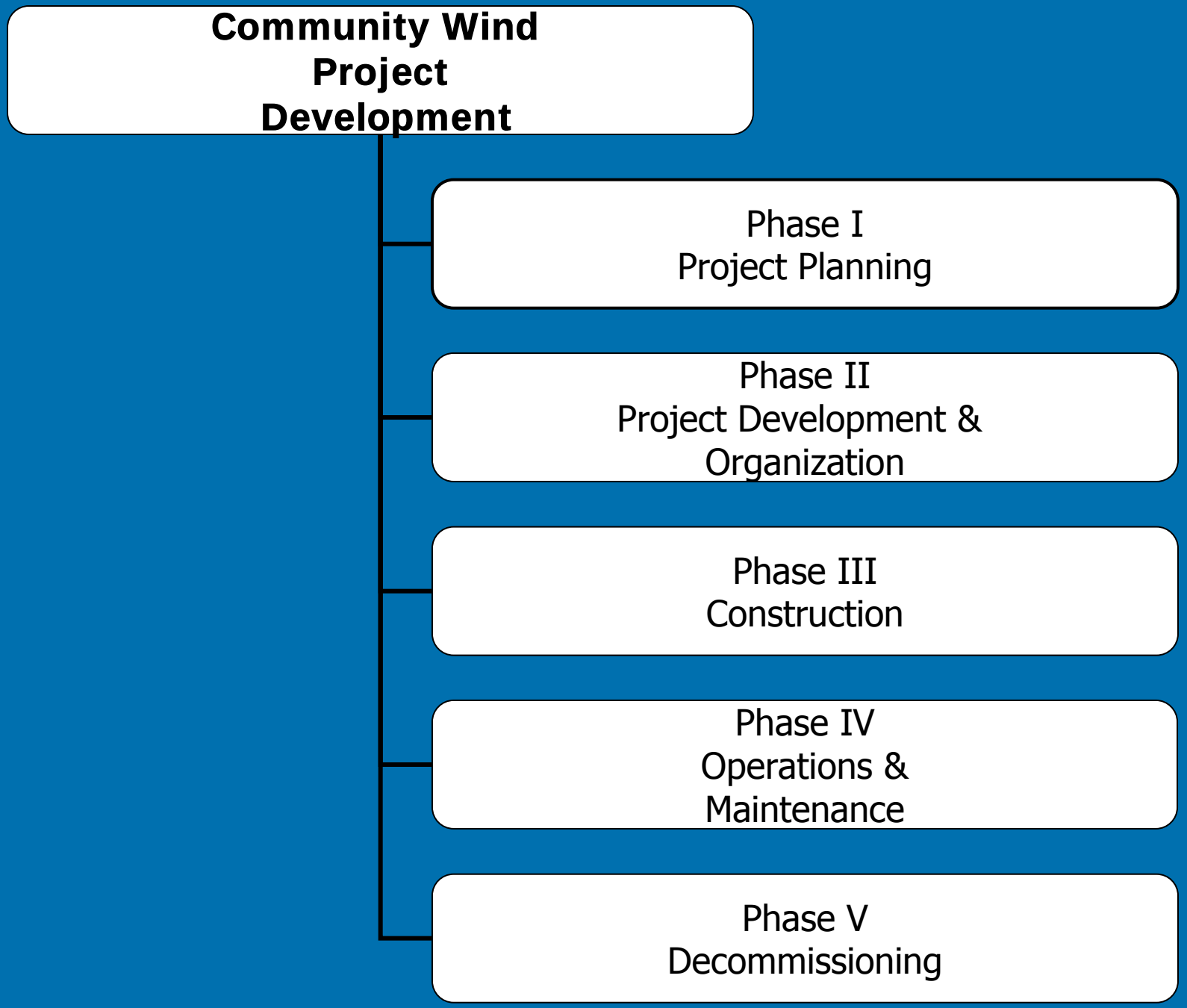
Public Ownership

- Municipal Utilities
- Public Schools
- Municipalities

Private Ownership

- Individual Farmers
- Local Businesses

WINDUSTRY™


Community Wind Project Development
Phase I
Project Planning
Phase II
Project Development & Organization
Phase III
Construction
Phase IV
Operations & Maintenance
Phase V
Decommissioning

Phase I-Project Planning

- Identify your project goals and areas where you will need to hire expertise
  - Determine and prioritize your primary project goals, so that as key decisions arise you are able to make a sound decision and preserve your project objective
    - What are your expertise and assets? Tax appetite? Big Energy User? Engineering or Technical expertise? Windy Land?
    - Why do you want to participate in wind? Money? Energy Security? Environmental?
  - Put together a reliable team and develop a governance structure
    - CEO, Board Members, Project Manager & Key Consultants
  - Choose an appropriate business structure for your team (LLC, LLP, Partnership, 'S' Corporation

WINDUSTRY™

Phase I-Project Planning

- Identify an Appropriate Site Selection
  - Strong Wind Resource
    - Class 4 or higher
  - Access to Transmission
    - 3-phase distribution or transmission line
  - Appropriate Zoning
  - Minimal Environmental Concerns
  - Public Acceptance
  - Land (leases/easements)

WINDUSTRY™

Phase I-Project Planning

☑ Raise seed capital to hire experts and perform feasibility studies

- Experts for studies:
  - Wind Resource
  - Environmental & Cultural Resource Impact
  - Interconnection Design
  - Visual Assessment and Sound Assessments
  - Others
- Feasibility Study

WINDUSTRY™

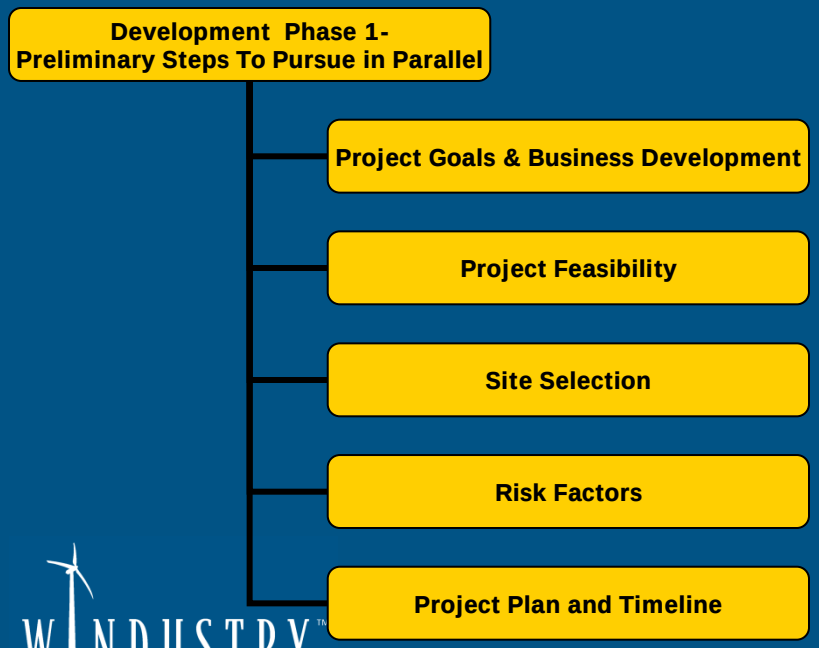
Feasibility Studies

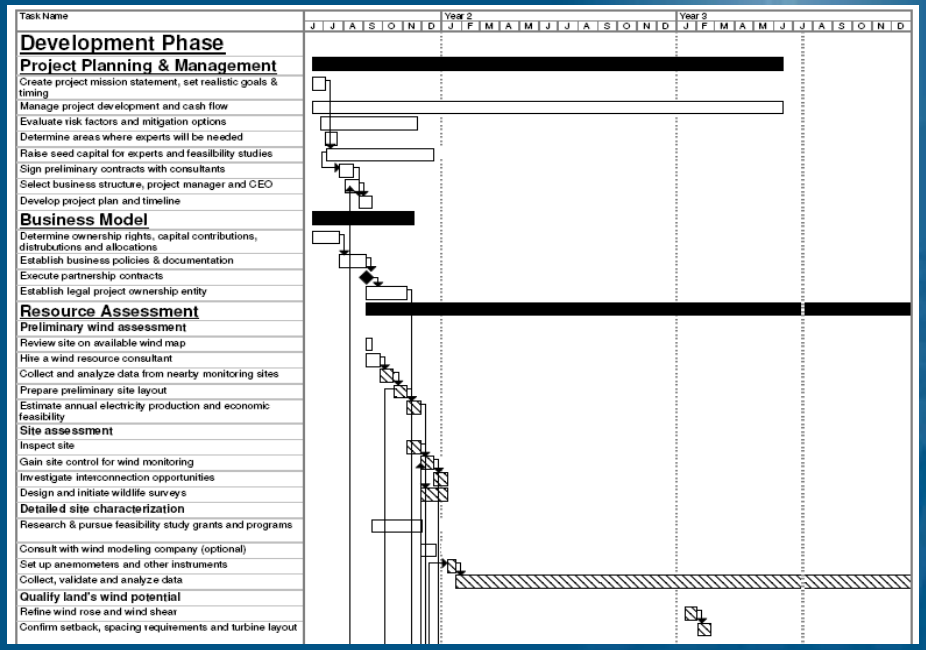
- Description of the project
- General Setting and Need for the Project
- Market Potential (current and future)
- Material & Equipment Procurement Plan
- Technical characteristics & Specifications
- Development Schedule and Production Plan
- Capital Requirements and Investment Schedule
- Sales Plan & Revenue Schedule
- Development Schedule and Production Plan
- Projected Operating Costs and Net Revenue
- Economic Feasibility
- Financial Plan
- Management Requirements for Project

WINDUSTRY™

Phase I-Project Planning

- Develop your project plan and timeline
  - Project plan should identify team members, defined tasks, assigned tasks, completed tasks and adequate timeline





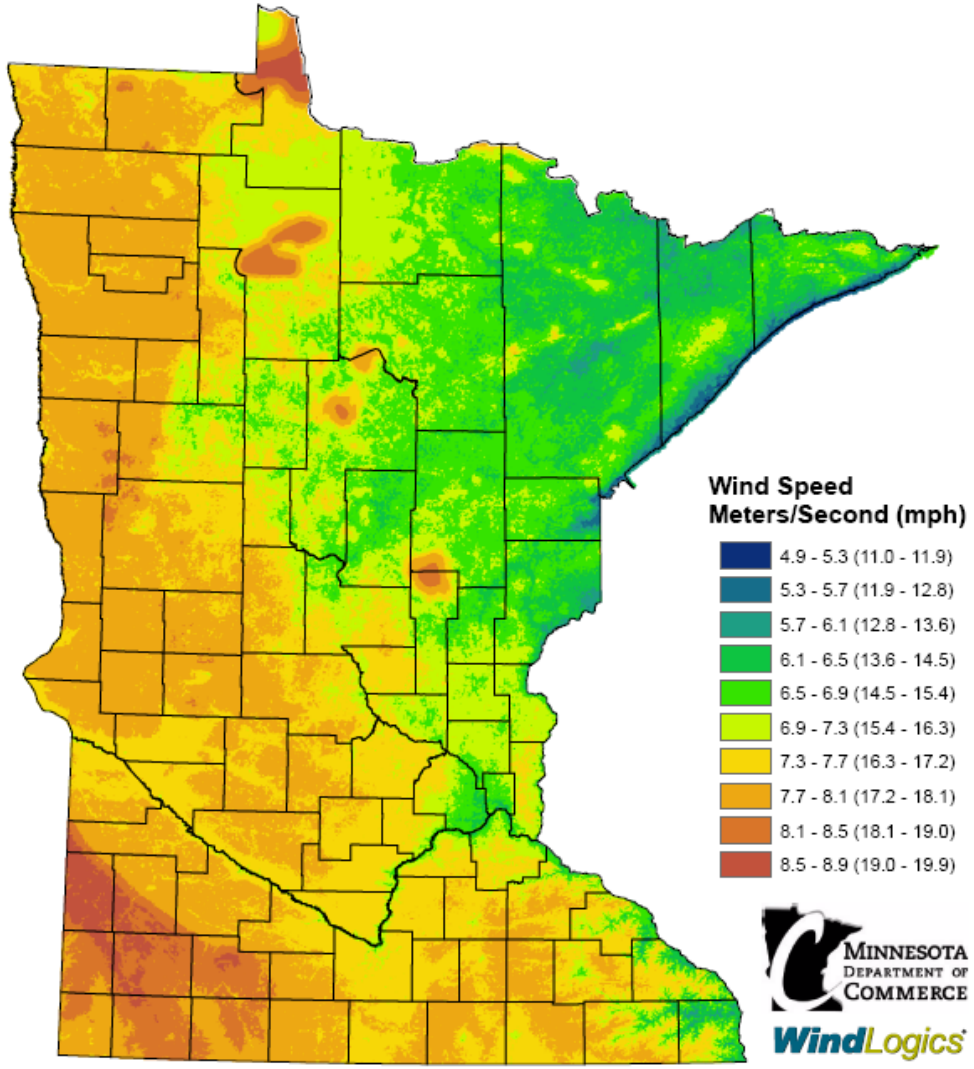
WINDUSTRY™

Phase I- Project Planning

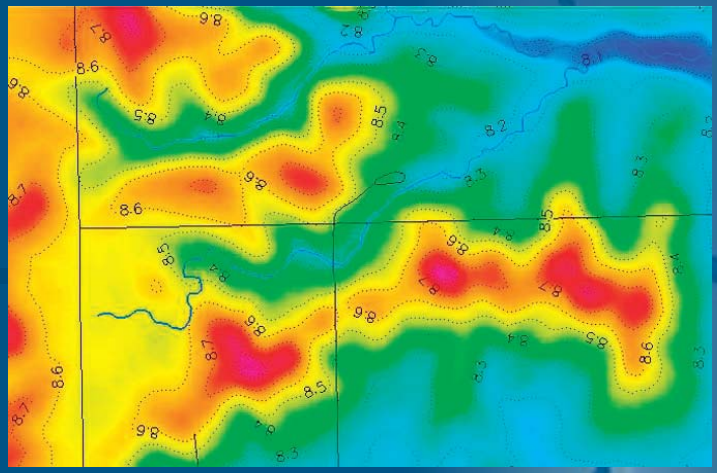
- Conduct a Wind Resource Assessment
  - Initial Assessment
    - Wind Maps
    - Existing Data
  - Detailed Site Characterization
    - Computer Modeling
    - Raw Data from Anemometer/Met tower
  - Long-term Validation of data (historical reference)
  - Detailed Cash Flow projections and Acquiring Financing
    - Project 'Bankability'
    - Typically one plus years of data collection

WINDUSTRY

Minnesota's Wind Resource by Wind Speed at 80 Meters



This map has been prepared under contract by WindLogics for the Department of Commerce using the best available weather data sources and the latest physics-based weather modeling technology and statistical techniques. The data that were used to develop the map have been statistically adjusted to accurately represent long-term (40 year) wind speeds over the state, thereby incorporating important decadal weather trends and cycles. Data has been averaged over a cell area 500 meters square, and within any one cell there could be features that increase or decrease the values shown on this map. This map shows the general variation of Minnesota's wind resource and should not be used to determine the performance of specific projects.



1)Anemometer and Wind Direction Vane 2) Datalogger 3) MetTower

Wind Development Process

Phase II- Project Development

- Land acquisition - Options/Easements
- Permitting /Siting
- Studies
  - Transmission Interconnection
  - Environmental/Wildlife Studies
  - Economic Feasibility
  - Business Plan Feasibility
  - Sound
  - Telecommunications
  - Shadow Flicker
- Turbine Selection and Purchasing
- Power Purchase Agreement
- Interconnection
- Financing
  - Final Feasibility Analysis
  - Risk Analysis
- Preconstruction engineering
- Construction bidding

WINDUSTRY™

Phase II- Land Acquisitions

- Main way for landowners to participate in wind energy development –including for community wind projects
  - No cash outlay
  - Low financial risk
- Landowners can provide their land to a community wind project
  - Providing land in exchange for an equity share
  - Leasing their land for monetary compensation
- Compensation varies widely based on turbine size, wind resource, price of energy and many other factors.
- Long term commitments – usually last 20 to 40 years.
- Options for easements and leases are typical components of most wind energy projects, large and small.

Phase II- Permitting

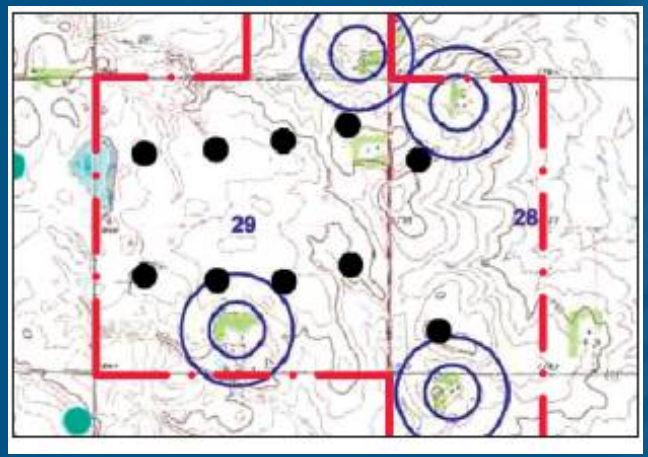
- Permitting Wind Energy in Minnesota
  - >5 MW permitted by PUC
  - <5 MW permitted by local ordinances
  - Project between 5 and 25 megawatts can, in lieu of PUC permitting, be permitted according to local ordinances if the applicable counties assume permitting responsibility and provide notice to the PUC.
- Federal permitting Agencies
  - Federal Aviation Administration
  - US Fish and Wildlife Service
    - Bald and Golden Eagle Protection Act and/or Migratory Bird Treaty Act
    - Endangered Species Ace
  - US Forest Service or Bureau of Land Management
  - Army Corp of Engineers
  - Federal Communications Commission
  - Others
- When federal agencies or federally managed lands and resources (monetary or otherwise) are involved, the requirements of the National Environmental Policy Act (NEPA) will apply.

WINDUSTRY™

Phase II- Siting

- Site Layout and Design
  - Setbacks
  - Turbine Layouts
    - Single vs. Multiple Turbines
  - Turbine Color and Signage
  - Appropriate safety measures (fencing, drainage, erosion controls)
  - Project Plans
    - Construction
    - Wildlife Surveys
    - Roadway Maintenance
    - Site restoration

- Factors to consider:
  - Land Use
  - Aesthetics
  - Property Values
  - Sound
  - Public Safety
  - Environmental and Cultural Impacts
  - Construction Impacts



WINDUSTRY™

Phase II- Turbine Selections/Procurement

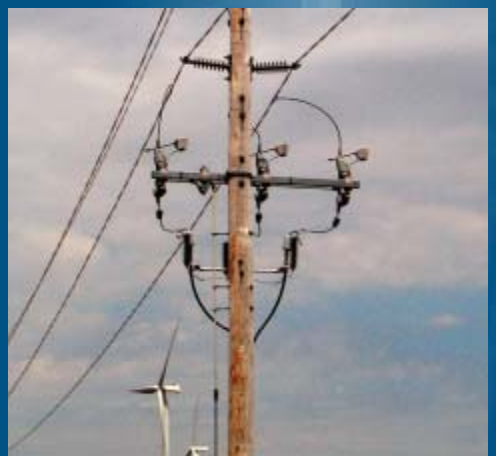
- Based on wind resource, project goals, availability, operations & maintenance, and reliability
- Turbines
  - Size (few kw to 3 MW)
  - Design (Horizontal vs. Vertical Axis)
  - Used/Re-manufactures Machines
- Cost (range from few thousand to few million)
  - Typically manufactures require 10-25% down
  - Lag time (few years, but beginning to change)

WINDUSTRY™

Phase II- Power Purchase Agreement

- Contract to buy the electricity generated by a wind project
  - Secure long term stream of revenue through the sale of electricity
- Needed to secure any equity or debt financing
- Typically 20 years in length from project commercial operation date
  - Provision that allow one or both parties to terminate if certain stipulations are not met
- Project Commissioning
  - Number of steps that must be met in order for a project to become commercially operational. Assures that the seller will be able to provide the buyer power
    - All testing and studies completed, Meets interconnection requirements, Communications between systems, Size determination, Security, permits received
- Price range (4.0¢/kWh to 6.4¢/kWh). Based on wind resource, geographic region, financing, transmission resources, turbine performance.
- Curtailments provisions
  - "Take or Pay"
- Transmission Upgrades
- Renewable Energy Credits (RECs)
- Insurance

WINDUSTRY™



Phase II- Interconnection

- The first step is to have conversations with those who have an understanding of the system in the area where you propose to connect your project.
- If applicable, the next step is to go through the Midwest Independent System Operator (MISO) In most cases you will likely need to complete a MISO study, which includes the following:
  - Interconnection Application
  - Feasibility Study
  - System Impact Study
  - Facility Study
  - Interconnection Agreement
- Executing the agreements & constructing additional infrastructure to get power on the lines
- For one or two turbine projects, it is advisable to connect the project at distribution level voltages, reducing need to build substation
- Early and open communication with MISO is suggested
- MISO Queue Process
  - Different for project > 20 MW and < 20 MW
  - Feasibility study, System Impact Study, Facility Study
  - Execute an Interconnection Agreement

WINDUSTRY™

Phase II- Finance

- Financial viability of your Project
- Equity and Debt
  - Typically 10-15 year loans for conventional projects, up to 20 for bond financing
  - Equity is up-front money into the project
- Getting a Loan
  - Detailed Cost and Production Estimates
    - Proforma financial statements, use of incentives, information on owners, list of all permits/contracts, risk mitigation plans, construction plans, insurance
  - Credit Guidelines
    - Majority lenders want equity contribution of 30 % of project costs
  - Evaluation
    - Accuracy and thoroughness of business plan
    - Strength of cash flow and financial statements
    - Adequate secured capital
    - Strength of governing board
    - Legal review of contracts, permits and easements

WINDUSTRY™

Project Costs

In the table below are two examples of cost breakdowns for a 2 MW project and a 50 MW project. This is to give you a rough idea about the percentage of total project budget that could be allocated for different project costs.

	2 MW	$/kW		50 MW	$/kW	
Feasibility	$20,000	$10	1%	$200,000	$4	0.2%
Project Design & Development	$60,000	$30	1%	$2,000,000	$40	2.5%
Pre-Construction Site Development	$20,000	$10	1%	$200,000	$4	0.2%
Turbine Deposits[1] (20% of cost)	$680,000	$340	17%	$14,000,000	$280	17.2%
Construction	$500,000	$250	13%	$9,000,000	$180	11.1%
Balance on Turbines (80%)	$2,720,000	$1,360	68%	$56,000,000	$1,120	68.8%
Total	**$4,000,000**	$2,000		**$81,400,000**	$1,628	
Annual Project Expenses *(including O&M)*	$85,000	$43	2%	$2,250,000	$45	2.8%

Phase III-Construction

Phase III

- Site Preparation and Project Management
- Construction and Commissioning

Phase IV & V

Phase IV

- Ongoing Operations & Maintenance – 20 to 30 years

Phase V

- Decommissioning and Removal of Wind Farm

WINDUSTRY™

Landowner Associations

- Started in Wyoming
  - Also interest in NM, CO, MT, SD, IN
- Result of landowner concerns about
  - Speculators profiting rather than the landowners
  - A neighbor getting a better deal than you
  - Compensation - getting good value for the resource and developable land
- Goal: Discover value of wind/land resource through developer competition & negotiate a solid deal

WINDUSTRY™

Trimont Area Wind Farm

- 100 MW Wind Farm (67 1.5 MW GE Turbines)
- Organized by group of local farmers and landowners (Pre-development)
- Answered a RFP from Great River Energy to develop the project
- Sold it to PPM Energy
- Some opportunity for revenue in addition to lease payments

WINDUSTRY™

Landowner Associations: Activities and Work Products

- Assoc. markets the collective wind/land resource through an RFP
  - Maps and photos of the area
  - Wind data and environmental assessments
  - Local regulations for siting
  - Landowner expectations outlined
- Score responses to the RFP
- Select a developer to negotiate with
  - All members vote
  - Voting rights detailed in operating agreement
- Association and developer negotiate on common lease terms for all members

WINDUSTRY™

Landowner Associations: Benefits to Developers

- What do Assoc.'s offer developers?
  - Create blocks of land owned by landowners who are educated on wind energy and interested in wind development
  - Minimizes costs to developer
    - Only one door to knock on, and it is full of ready and willing landowners
  - Political strength of a significant number of landowners who support wind development in the area
  - Reduces local opposition to the wind project

WINDUSTRY™

Major Points to Keep in Mind

- Expansion of community wind due to improving economics, innovative business models and effective public policies
- Economic, social and environmental advantages accrue to local community
  - Community wind has 5 times the economic impact on local value added, and 3.4 times the impact on local job creation, relative to a corporate-owned development. http://cda.mrs.umn.edu/~kildegac/CV/Papers/IREE.pdf
- Involve your neighbors and the public
  - Be prepared to explain how the project will help keep their power costs down
  - Answer their basic questions
  - Take into account their concerns and work with them to build a level of comfort and support

WINDUSTRY™

Major Points to Keep in Mind

- Projects take hard work, innovation, champions and public policy support
  - Planning and development typically takes several years
  - Dedicated team of professionals with consultants in business, finance, easements, PPAs, engineering, construction & project management
- Provide major new economic opportunities connecting main street America with a new industry

WINDUSTRY™

toll free (800) 946-3640
Melissa's phone (612) 870-3465
e-mail melissa@windustry.org

www.windustry.org

"Community wind helps get people connected to their energy use. Local energy production helps to build a better society, a better culture, and a better planet."
--David Benson, Nobles County Commissioner & Farmer