

# Barriers to Distributed and Community Wind



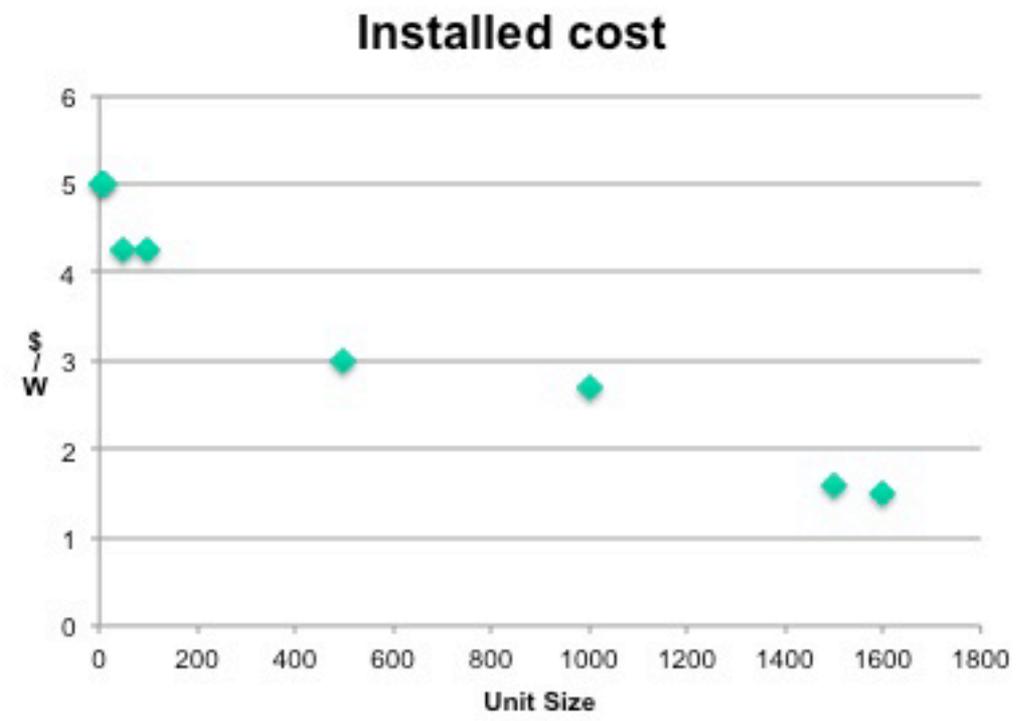
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National Renewable Energy Laboratory

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# Distributed Wind Barriers

- Economies of Scale
  - Incidental costs loom large(r)
    - Permitting
    - Community engagement
    - Financing costs
    - Construction
    - Interconnection
    - O&M



# Distributed Wind Barriers

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- Permitting
  - Lack of existing/consistent ordinances
  - Incentives that activate environmental permitting req's
  - DNRs/FWS lacks experience with DW
- Need to educate each customer/market sector anew
  - Each education campaign requires investment
  - Each project requires careful community management
- Efficient installations (standardized process, knowledge) are essential to controlling installation costs (\$11/W)
- Financing
  - Difficult to identify workable financing rates  
(new models evolving)

# Distributed Wind Barriers

- Interconnection
  - Not standardized
  - Costs (“small” costs can represent large fractions)
  - Interconnection agreements need tuning
    - Often designed for larger projects (Merchant)
    - Required technical data (can be hard to find)
  - Can be a daunting process (even for engineers)

(would sample interconnection agreements help?)

**FIRSTENERGY INTERCONNECTION APPLICATION**  
 For an Expedited Level 2 and Standard Level 3 Review - Generation Up To 20 MW<sup>1</sup>  
 (To be filled out and submitted prior to installation)

**CUSTOMER GENERATOR CONTACT INFORMATION**

**Legal Name and Mailing Address of Customer-Generator:** (if an individual, individual's Name)  
 Name: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

**Contact Person (if other than Name):**  
 Mailing Address (if other than Name): \_\_\_\_\_  
 Telephone (Daytime): \_\_\_\_\_ (Evening): \_\_\_\_\_  
 Facsimile Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

**Alternative Contact Information:** (if different from Customer-Generator above)  
 Name: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 Telephone (Daytime): \_\_\_\_\_ (Evening): \_\_\_\_\_  
 Facsimile Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

**The Customer-Generator Facility's Information:**

Facility Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: OH Zip Code: \_\_\_\_\_  
 Nearest Crossing Street: \_\_\_\_\_  
 Electric Distribution Company ("EDC"): Select Utility \_\_\_\_\_  
 Account #: \_\_\_\_\_ Meter #: \_\_\_\_\_  
 Existing Service Voltage: \_\_\_\_\_ VAC Existing Service Capacity: \_\_\_\_\_ Amps Select Phase \_\_\_\_\_  
 Current Annual Energy Consumption: \_\_\_\_\_ kWh Estimated In-service Date: \_\_\_\_\_  
 Do you plan to export power? <sup>2</sup> Select \_\_\_\_\_  
 If Yes, Estimated Maximum: \_\_\_\_\_ kW<sub>ac</sub> Estimated Gross Annual Energy Production: \_\_\_\_\_ kWh  
 One-line Diagram Attached (Required): Select \_\_\_\_\_ Site Plan Attached (Required): Select \_\_\_\_\_  
 Energy Source: Select \_\_\_\_\_ Gross Generator Rating: \_\_\_\_\_ kW<sub>ac</sub>  
 Utility Accessible Disconnect: Select \_\_\_\_\_

**Requested Level of Review:** Select \_\_\_\_\_ **Type of Generation Equipment:** Select \_\_\_\_\_  
 Level 2: Expedited Review - Certified, Inverter-based generation, Up to 2 MW - Page No 3  
 Level 3: Standard Review - Rotating Equipment or Inverter based generation that does not meet the requirements for Level 2 Review - Page No 3 or 4

# Distributed Wind Barriers

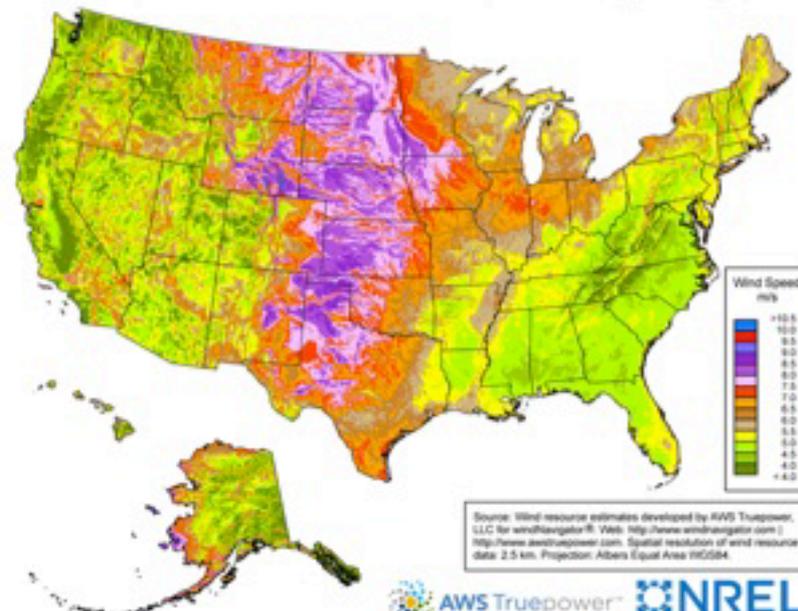
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- Operations/Maintenance
  - Small turbine maintenance requirements are modest
    - But still can require a visit
    - Cost of a visit can be significant (compared to savings)
  - Mid-scale machines are more complex
    - Require service (crews = 2 people = \$2k/day)
    - Mobilization fees can represent significant costs (\$2k)

(owners can/should band together)

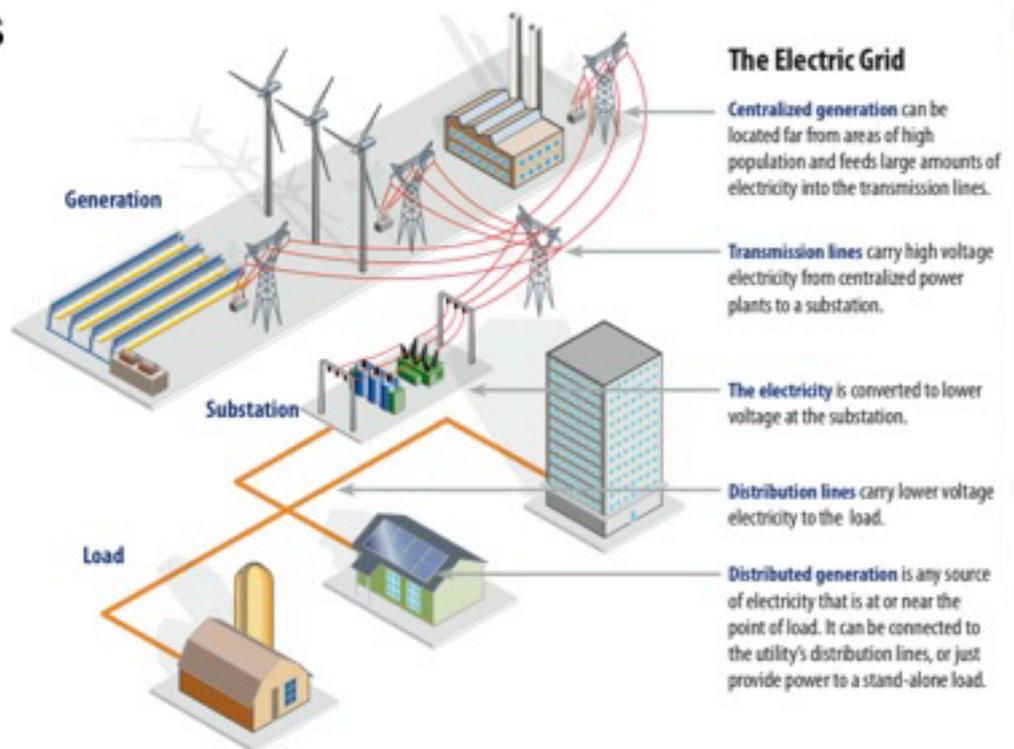
# Community Wind Barriers

- Access to Market
  - Long-term contracts
  - COOPs represent large opportunity but have tremendous inertia
  - Standard offers (where available) are proving attractive
    - Not widely offered
  - Lack of creative market vehicles
    - Could DW/CW be used to meet executive order requirements for RE?



# Community Wind Barriers

- Economies of scale
  - Difficulty in securing competitive equipment pricing
  - Grid/Environmental Impact Studies (wrong-sized requirements)
  - Balance of Plant costs
  - Delays can have (relatively) larger cost impacts



# Community Wind Barriers

- Access to financing
  - Lack of sophisticated lenders
  - Lack of sophisticated equity partners
  - Transaction costs (door fee) constitutes a large(r) fraction for smaller projects
  - Difficulty/cost in/with identifying equity partners that can leverage federal incentives



# Thoughts going forward

- Community wind and distributed wind are an important facet of the wind industry
  - Represent the technology/human interaction at its most proximal level
  - Often activate the social acceptance issues earliest
  - Opportunities abound for process improvement/facilitation
  - In this context we look forward to engaging in the conversation of how we can best support this market sector

