



Wind Energy Project Viability

BP Wind Energy

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A business opportunity



BP wants to be recognised as a great company – competitively successful and a force for progress. We have a fundamental belief that we can **make a difference** in the world.

We help the world meet its growing need for heat, light and mobility. We strive to do that by producing energy that is affordable, secure and doesn't damage the environment.

BP is progressive, responsible, innovative and performance driven.

BP is building alternative energy businesses with the potential to grow and compete far into the future. That requires us to identify today's most promising alternative technologies and transform them into sources of secure, reliable and cleaner energy.

We invest more in this area than any other international oil company. At its launch in 2005 we committed \$8bn to our Alternative Energy business and invested \$1.4 billion during 2008.

We are focusing our investment on areas with significant long-term growth potential – wind, solar, biofuels and hydrogen energy and carbon capture and storage.

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- We are a leading developer/owner-operator of wind generation assets focused on the US market.
- We have formed a joint venture with Clipper Windpower to develop the Titan wind project in South Dakota - the world's largest wind farm at 5050 megawatts (MW).
- We have interests in 6 operating wind farms of > 1 GW capacity.
- We have two wind farms in construction: the 200 MW Fowler Ridge II Wind Farm in Indiana, and the 25 MW Titan I Wind Farm in South Dakota.
- We have a wind pipeline of some 100 projects across 24 States with a potential generating capacity of 20 GWequivalent capacity to building 40 gas-fired power stations.
- BP donated \$2 million to fund wind energy research programs within the school of engineering at the University of Wyoming.
- BP has two wind energy projects currently under development in Wyoming.



What makes a wind energy project “viable”?

- Adequate Wind Resource
- Suitable Location
 - No conflicts with existing / planned land uses
 - Stable soil
 - Environmentally compatible
 - Clear permitting path
- Transmission Access / Service
- Receptive Market

**Cost of
Energy**
\$/MW-hr

Determining cost of energy

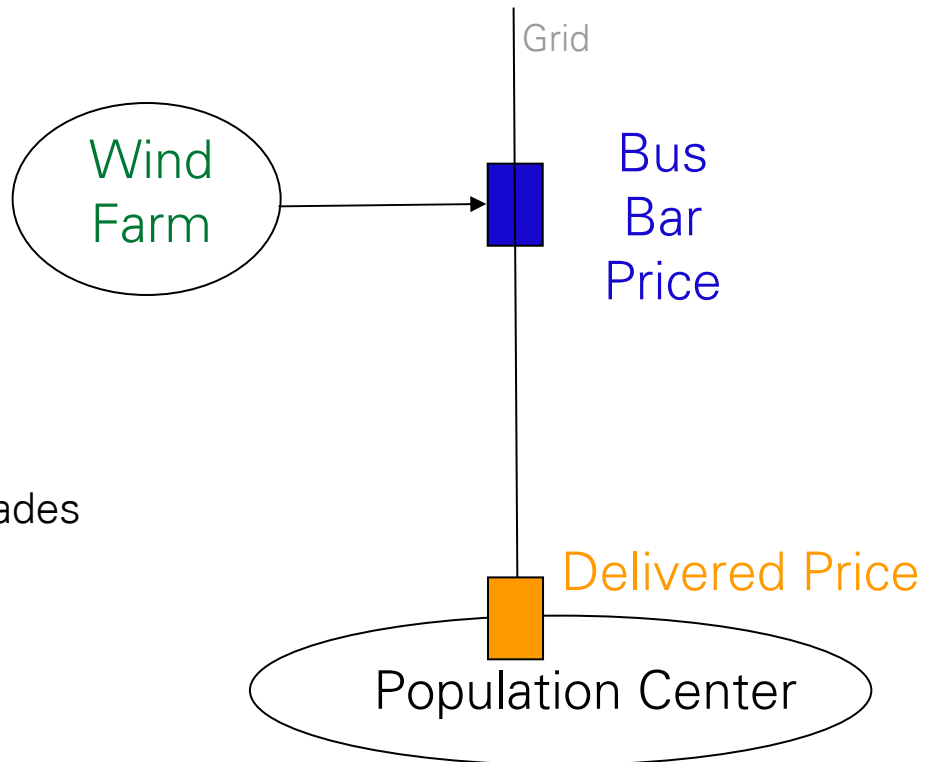


- Inputs to **Bus Bar Price**

- Net Capacity Factor
- Capital Costs
 - Turbines, Balance of Plant, Interconnection, Buildings, Sales Tax
- Operating Costs
 - Turbine Warranties, Labor, Maintenance, Environmental Expenses, Admin Costs
- Landowner Payments
- Taxes
 - Property, State and Federal Income
- Financing Costs
- PTC / ITC / Grant
- Rate of Return

- Additional Inputs to **Delivered Price**

- Transmission Tariff(s) and/or System Upgrades
- Balancing/Shaping Fees



Marketing Wind Energy in WECC



- Successfully marketing wind energy requires a competitive power price and a utility with an appetite for the product.
- Two methods for marketing wind energy:
 - Responding to Requests for Proposals
 - Competitive bid scenario run by the utility
 - Timing of requests determined by the utility
 - Bilateral Transactions
 - Energy is offered to the utility outside of an RFP
 - Generator can prompt conversation; not all utilities will discuss power purchases in this fashion

Project Viability in Wyoming



- Historically, proximity to load (population centers) has trumped wind resource when determining viable wind farm locations.
- Wyoming has strong wind resources, but very little local demand for wind energy.
- The question now is whether the market for wind energy has changed enough to make Wyoming wind competitive in population centers.
- The answer is uncertain, and depends on a number of factors:
 - Appetite for out-of-state renewable energy within the west coast power markets
 - Availability of transmission service to those markets
 - Cost of transmission service to those markets
 - State and Federal mandates
 - Wyoming policies toward renewable energy generation

Questions



The Flat Ridge I Wind Farm, Kansas

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