S·POWER
An AES and AIMCo Company

Wind Technology

150+ Projects
North America and UK

3 Billion kWh
And Counting

1.3 GW
Operating Assets

10 GW
Operating |Construction |Pipeline

Wind - The Basics

EVOLUTION, DEPLOYMENT, DEVELOPMENT

Evolution of Wind Technology

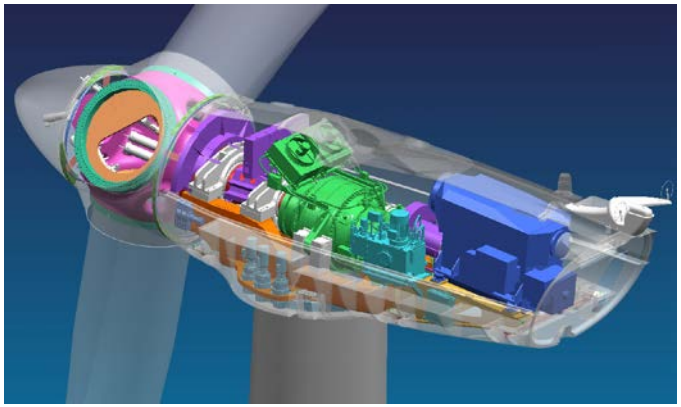
- Moved from a 1MW to 2MW to 3 MW and next 4 MW platforms
- Larger machines reduce balance of plant costs on a per MW basis
- Reliable installation procedures of a mature industry

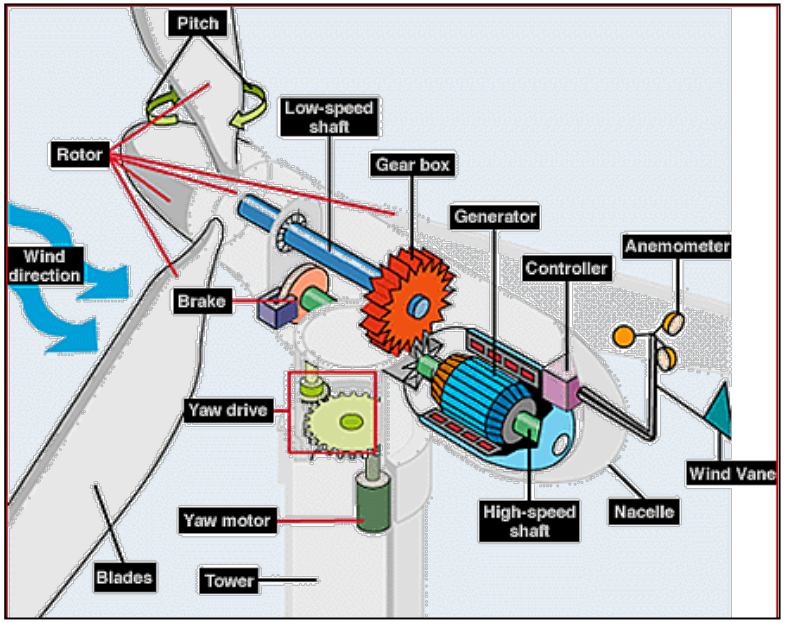
Wind Projects

- Distributed generation less than 20 MW
- Utility scale projects

Development Timeline

- Wind resource varies by terrain and location
- Interconnection
- Permitting & Studies
- Site acquisition
- 24 to 36 months





Wind

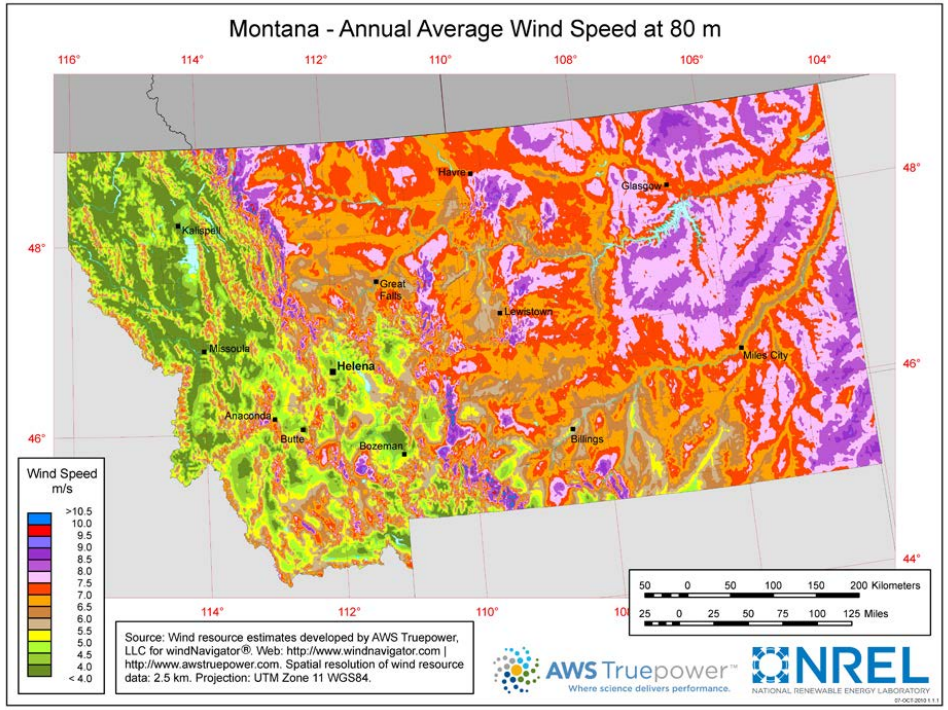
MONTANA

Resource In Montana

- Good wind resource mostly in the eastern 2/3 of the state
- Seasonal resource variability, summer vs winter
- Time of day resource variability
- Locational variability

What Wind Offers

- Energy as available
- Paired with storage to offer capacity

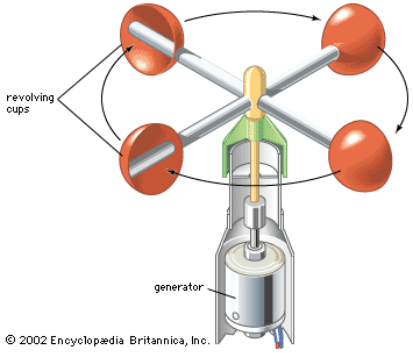


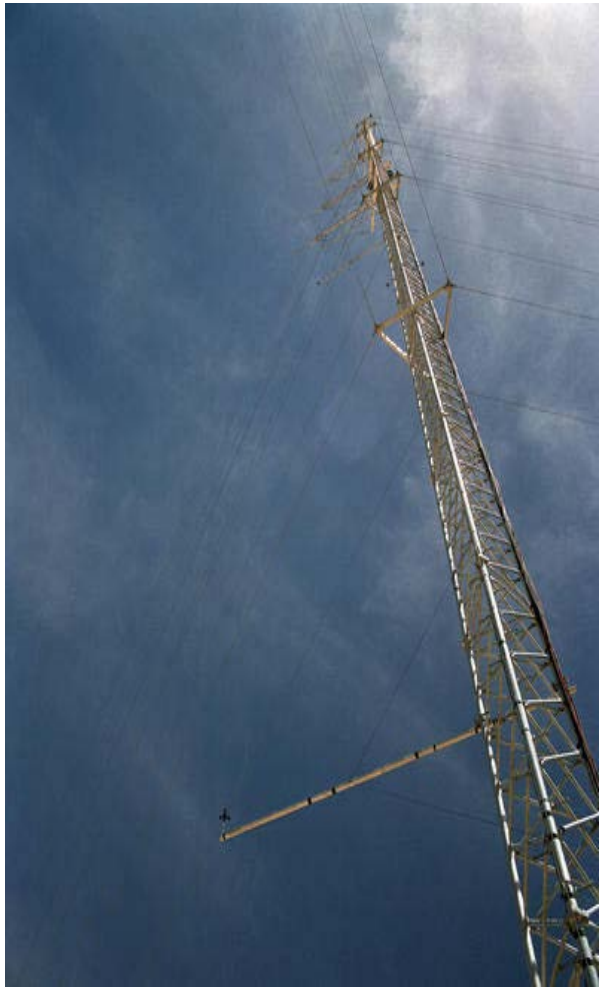
Wind

MEASURING THE RESOURCE

Cost of Energy

- Average annual wind speed
- Duration of measurement campaign
- Uncertainty P50 vs P99
- Turbine selection
- Wake losses





Wind

COST & RELIABILITY

Cost

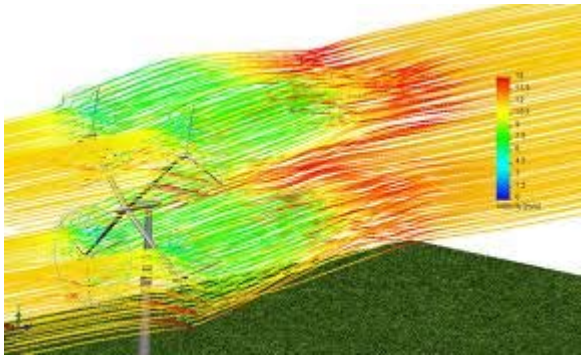
- Varies by site and added infrastructure
- Site preparation work
- Interconnection
- Improvement in turbine reliability and increase in turbine size
- Turbines make up approximately 2/3 system cost
- Over all project size

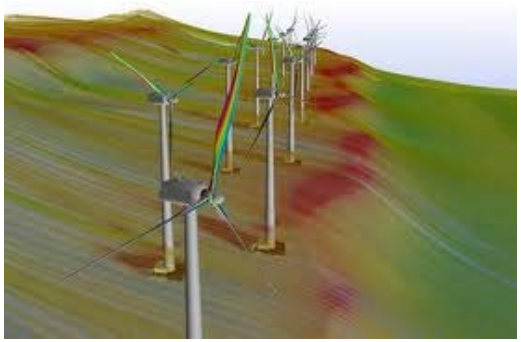
Reliability & Life

- 30 year life
- Capacity factors in the high 30s low 40s
- Large rotational machinery

Keys To Operational Reliability

- Service agreement arrangement
- Product warranty, turbines and balance of plant
- System monitoring – key performance indicators





Pioneer Wind Park 80 MW
Glen Rock, WY **2017 Eclipse**