



Nacelles Sourcing Story

Colorado, September 2, 2010

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Vestas Nacelles

Supply Chain Management - Americas

Nacelle Strategy

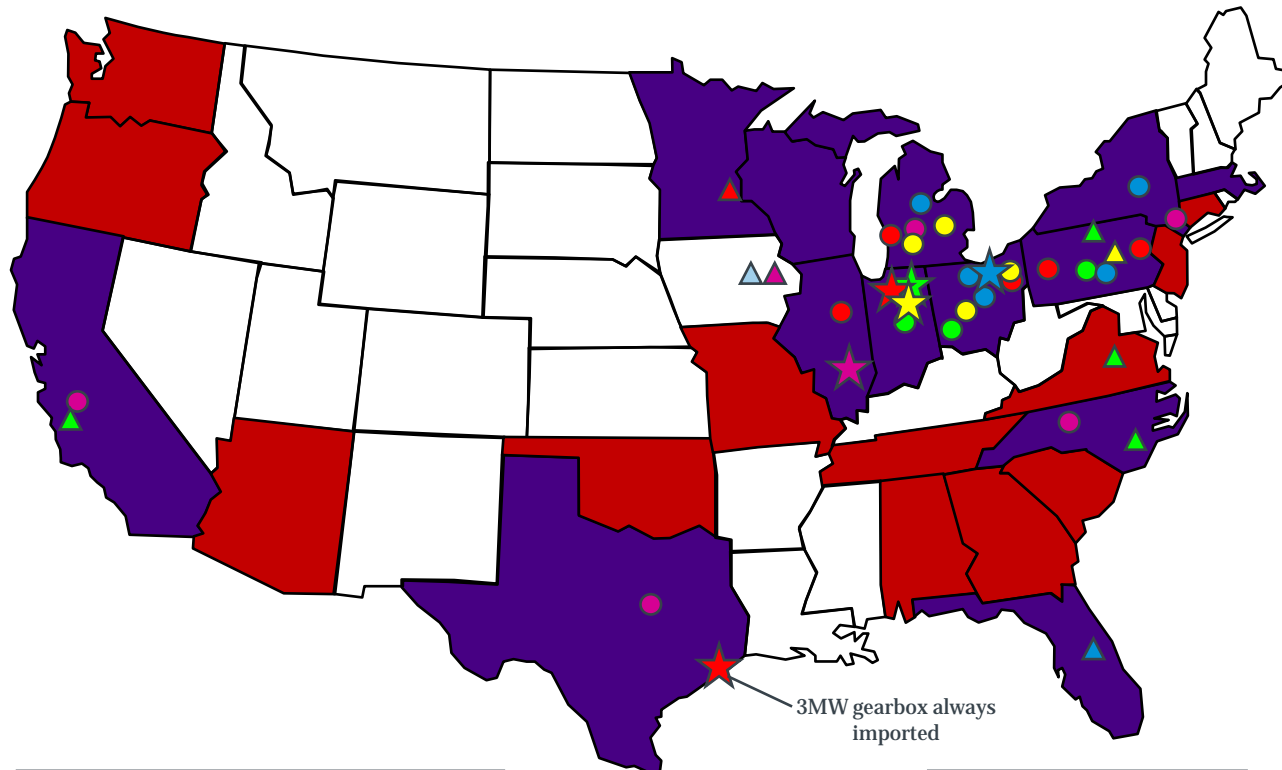
The overall sourcing and manufacturing strategy:



**In the region
for the region**

Nacelle Supplier Locations

Location of Suppliers and Competitors



Supplier Information		
	Existing Suppliers	Modeled Location
Foundry	●	★
Machining	●	★
Gears	●	★
Generators	●	★

Turbine Manufacturers	
▲	GE
▲	Gamesa
▲	Suzlon
▲	Siemens
▲	Mitsubishi

State Ranking for Potential Suppliers	
■	Top Quartile
■	2 nd Quartile

Nacelle Factory

Why did Vestas choose to settle with our factories in Colorado?

- **skilled** work force
- high **educational** level
- logistics- e.g. **rail** support
- **governmental** support

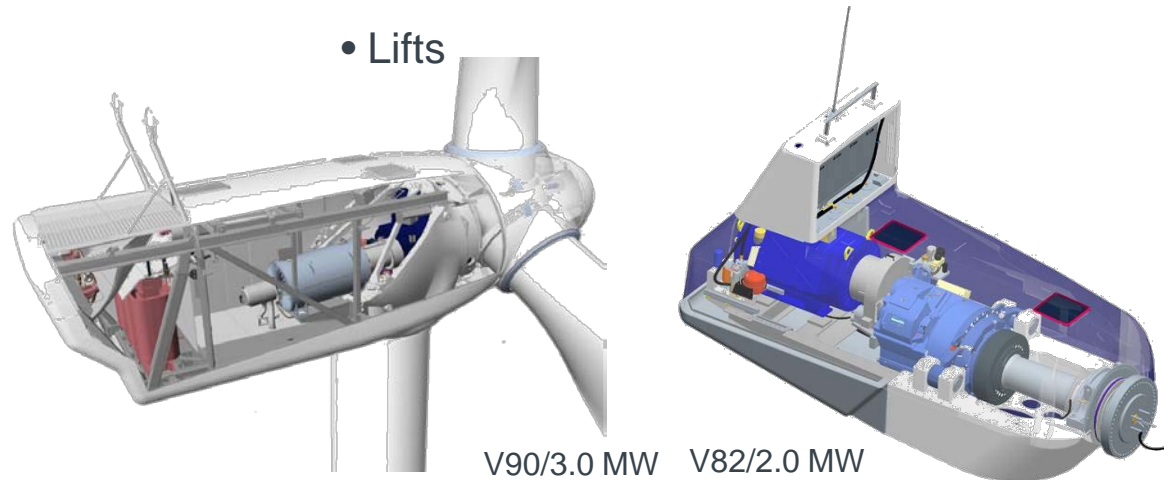


Nacelle Chicago

- Centrally located within the **region**
- Readily available **talent**
- **Shortened** response time
- Close to **supply** base

Nacelle Supply Opportunities

- Bearings
- Castings
- Hydraulics, pumps
- Weldings
- Lubrications systems
- Fasteners
- Plastics
- Machined components
- Wires and Cables
- Sheet metal work
- Transformers
- Lifts



Nacelle Key Supplier Criteria

- Category **competences**
- **Experienced** low volume – medium mix
- Lean and Six Sigma **skills**
- **Business** methods – e.g. ISO 9000 and 14001
- Experienced **quality** oriented staff
- Solutions **provider**

What we learned – Where N. America differs

- Advance product quality **planning**
- Production part **approval** process
- Less Industry **experience**
- Capacity to utilize transferrable **competencies**

What we learned - N. America Strengths

- Ability and flexibility to **invest**
- **Quick** conversion into wind products
- Highly **transferrable** skills
- Suppliers in **all** categories
- **Quality** toolkit
- Many industry **support** organizations
- Euro standards **not impossible**

What we learned - Areas to Build on

- Experience in **wind**
- **Continuous** improvements
- One-piece **flow**
- Foreseeability to **grow**
- Build on **core** competences

What Suppliers Face

- Wind leads **renewables** growth
- Entry to **market** growing
- **Uniform** supplier standards
- Supply **weaknesses** visible in low volume
- Bottlenecks **can** occur
- Competitive advantage - **continuous improvement**

Nacelles Sourcing Expectations

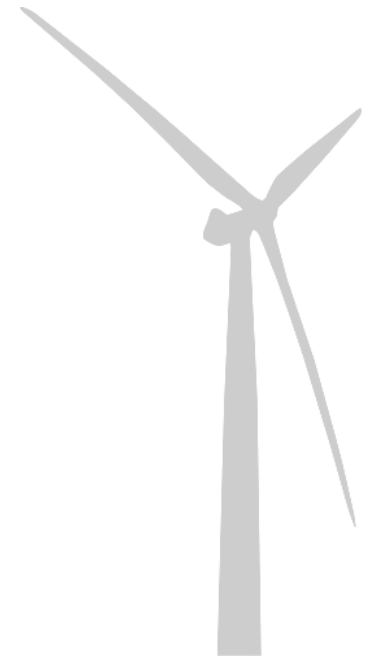
- **Safety** and quality - a given
- **Innovations**
- Increased **partnering**
- Product **reliability**
- **Multiple** sourced critical parts
- **Production** readiness/agility

Expected Supplier Toolkit

- **Advance** product quality planning
- Production part **approval** process
- Trial form, fit and function **tests**
- “**Critical to quality**” features
- **Record** retention

Supplier Quality Must-haves

- Must have a Culture of Quality: **OWN** your product quality
- **Improved** controls and test coverage
- Improved **responsiveness**
- **Ownership** of problem resolution

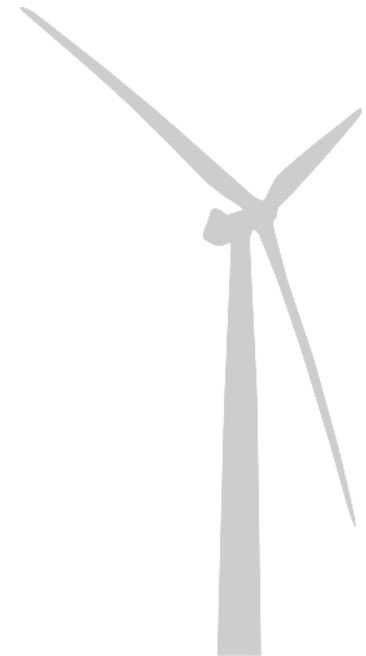


Supplier Selection Observations

- Search **supported** by government and trade associations
- Many as a result of Economic **Downturn**
- **Avoidance** of capacity bottlenecks
- **Credit** Conditions slow or prevent investment(s)

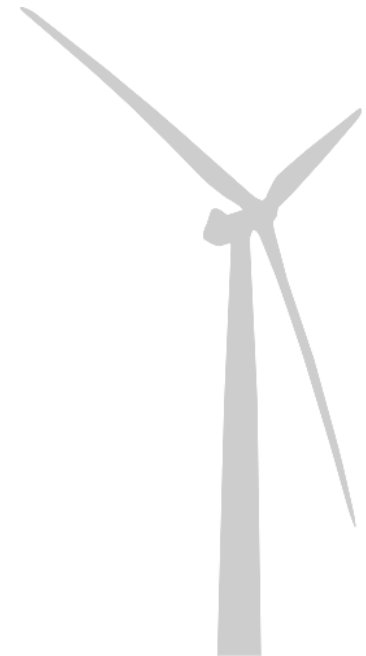
N. America Sourcing Outlook

- Demand for High Quality and Delivery
- Competition based on **quality, delivery and cost.**
- European standards **not impossible.**
- Industry driven **ISO9000-like baseline**



Supplier – After the contract

- **Weaknesses** readily visible
- Improved control **planning**
- Poke yoke **problem** resolution
- **Error** proofed manufacturing
- **LEAN** implementation
- **Six Sigma** capability and problem resolution



Supplier – After the contract

- Product received must meet **all** requirements
- **Avoid** un-validated product/process changes
- Control Critical characteristic(s) **statistically**
- **LEAN** one-piece flow
- Culture of continuous **improvement**

Thank you for your attention

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