



# Wind is Global GSCMI Presentation

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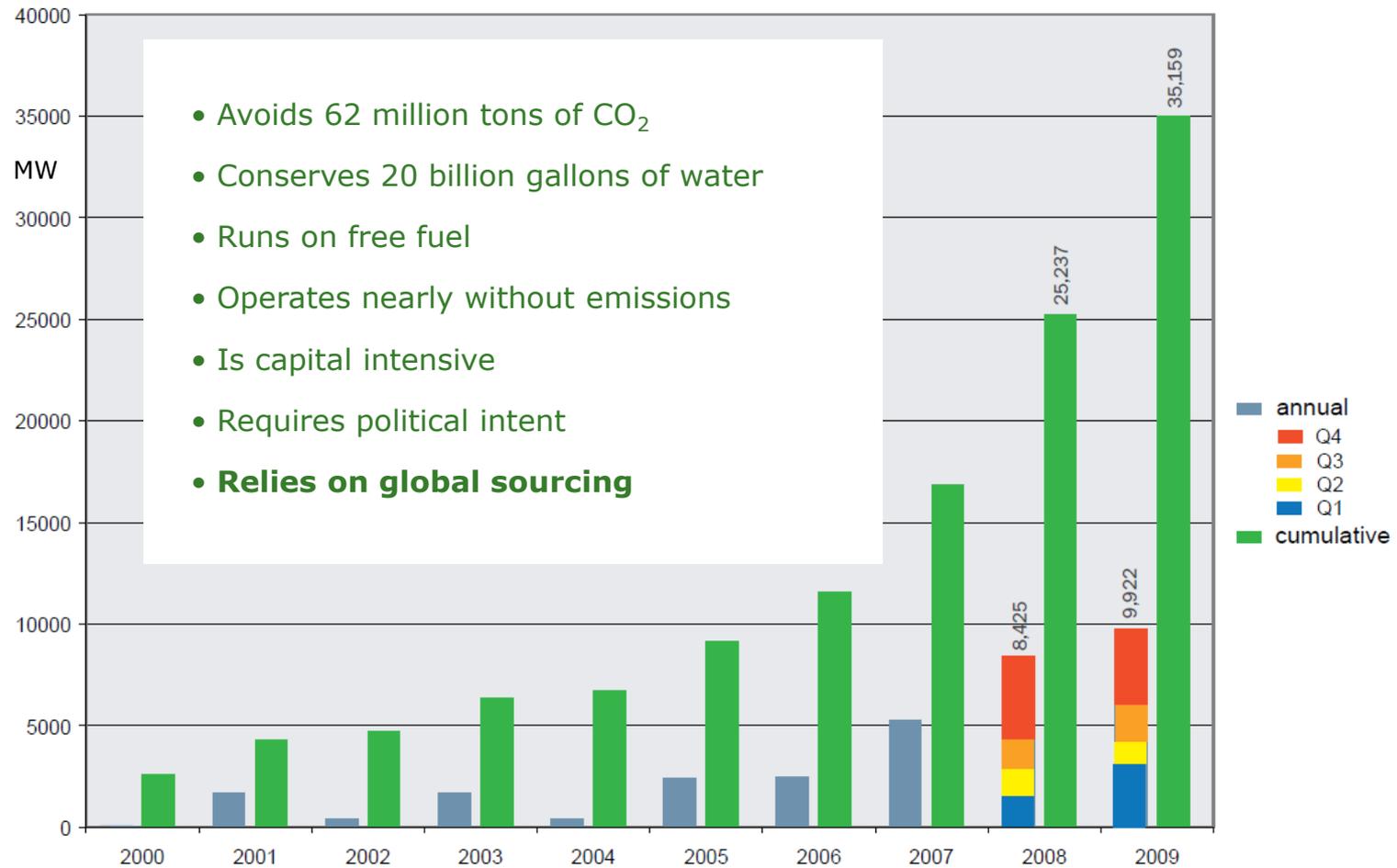
# Agenda

- General Information & John Deere's Role
- Building wind farms
- Three challenges of a new, fast growing industry
  - Global supply chain
  - Logistics hell
  - Quality

"At the end of the presentation, I want you to see the global nature of the wind energy business as well as a need for cultural awareness in business transactions ..."



# Strong Growth of U.S. Wind Generation



Source: American Wind Energy Association

# John Deere Wind Energy Intro

A business unit of John Deere Renewables & Deere & Co.

- Development and Financial Services focus – no manufacturing role
- Commitment to Ag energy and rural economic growth
- Portfolio of 734 MW in 36 projects (2 to 80 MW in size)

Successful projects through Integrated Business Processes:

- Real estate development and utility relations
- Supply chain and technology expertise
- Construction and on-going operation

Who better to help you harvest the sky?

# Building Wind Farms

## Bringing it all together

- Roads and Civil Work
- Foundations
- Deliveries, Logistics
- Electrical Work, Substation
- Utilities
- Turbine Erection
- Tower Wiring, SCADA
- Commissioning

~ 25 Major Suppliers  
and Contractors involved

Weather impacted



# Building Wind Farms

## End Result

### Typical project:

- \$3M - \$4M cost per WTG
- 6 to 12 months duration
- 20+ years design life

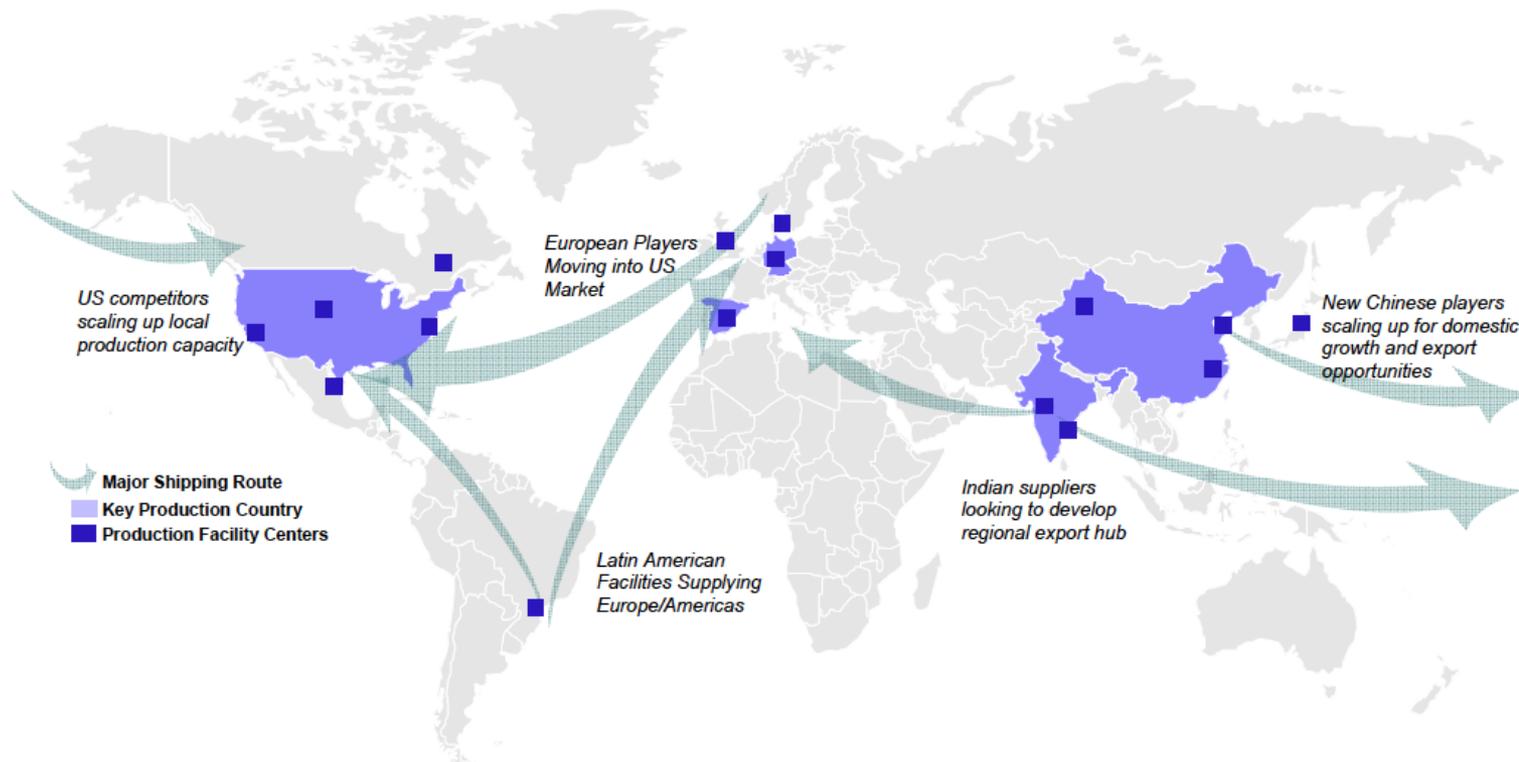
Green Energy,  
coexisting with  
agricultural land use.



# Supply Clusters Evolve In Strong Markets

Strong markets are characterized by:

- Consistent political intent
- Sizable potential



Source: Emerging Energy Research

# Global Supply Chain (Understand Diverse Cultures)

Leveraging John Deere's expertise in:

- Market assessment
- Technologies
- Relationships
- Supply processes and contracts

Strategic relationships with leading WTG suppliers representing 76% market share

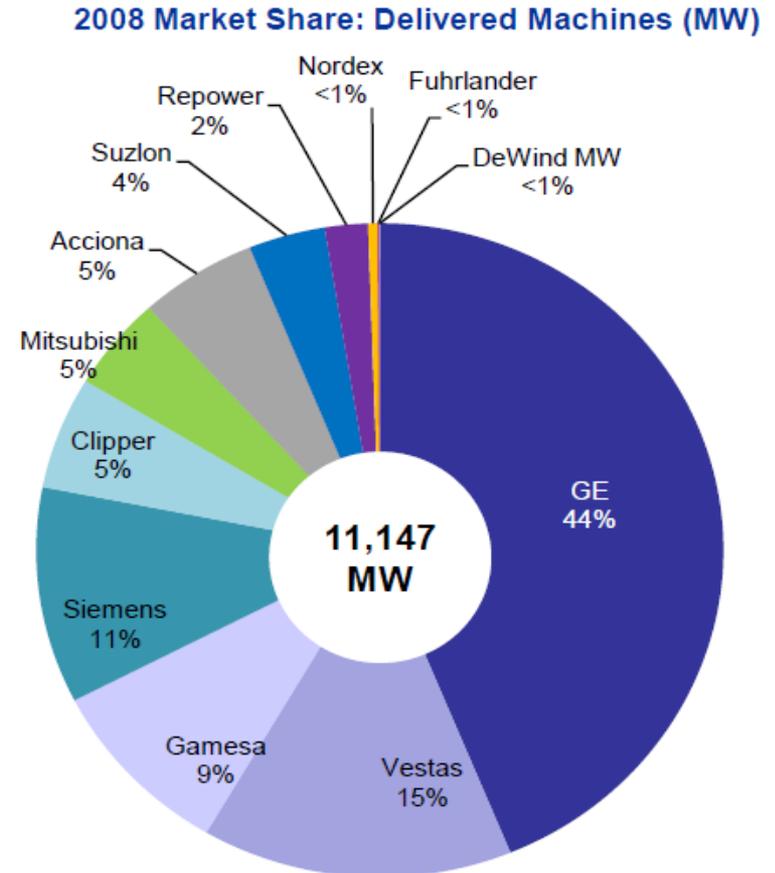
- Lumpy demand
- Frame and project-specific WTG supply agreements

Network of large and small contractors

- Typically E, P, and C unbundled

Cultural Differences:

- Misunderstanding cultural nuances can wreak havoc on good plans
- When a "yes" can mean "we'll do our best."



Source: Manufacturers, Emerging Energy Research

# Logistics Hell (Planes, Trains and Automobiles)

Components originate in supply clusters on 2...3 continents:

- Heaviest loads weigh 160,000 lbs
- Blades are 150' long
- Multimodal shipping
- 9 truckloads per WTG
- Up to 36 truckloads for a main crane
- Superload Permits
- Frost laws and seasonal weight restrictions
- JIT would be a risky proposition.



“You need to know  
Where the goods are.”

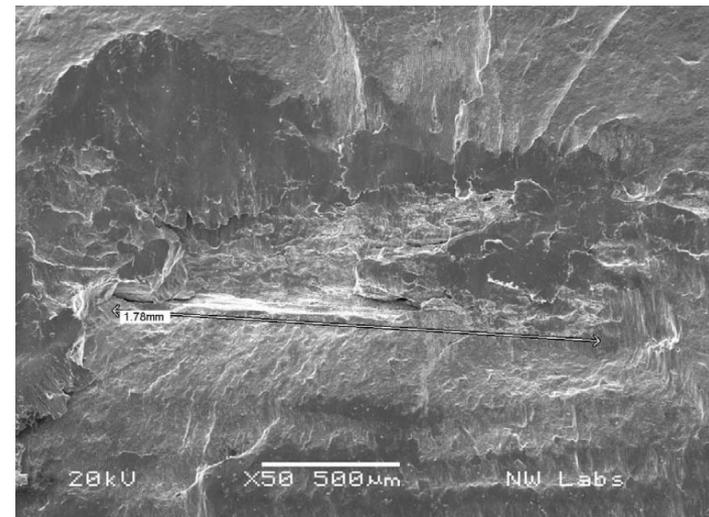


# Quality (Don't Make Assumptions)

- Cliché: "Because in America, you think a certain amount of error is normal. You expect the plane to be late...You expect the washing machine to break down...But Japan is different. Everything works in Japan." (*Michael Crichton, 1992*)
- Practical example: Failure of a gear. (*Made in Germany, 2008*)



Gearbox teardown shows cracked tooth #16



Forensic investigation reveals non-metallic inclusions

# Summary

Wind industry continues to grow up:

- Technologies improve through infusion of best practices
- Supply chain is vastly global
- Enduring success comes from strong relationships with suppliers
- Successful business execution requires processes and cultural understanding
- It takes well educated leaders and work force to maximize value creation.