



# How Does Wind Measure Up (*Safety – Issue and Opportunity*)

**Windpower 2012    June 6, 2012**

***Rick Kroon, Vestas VP Sustainability***

# How Does Wind Measure Up?

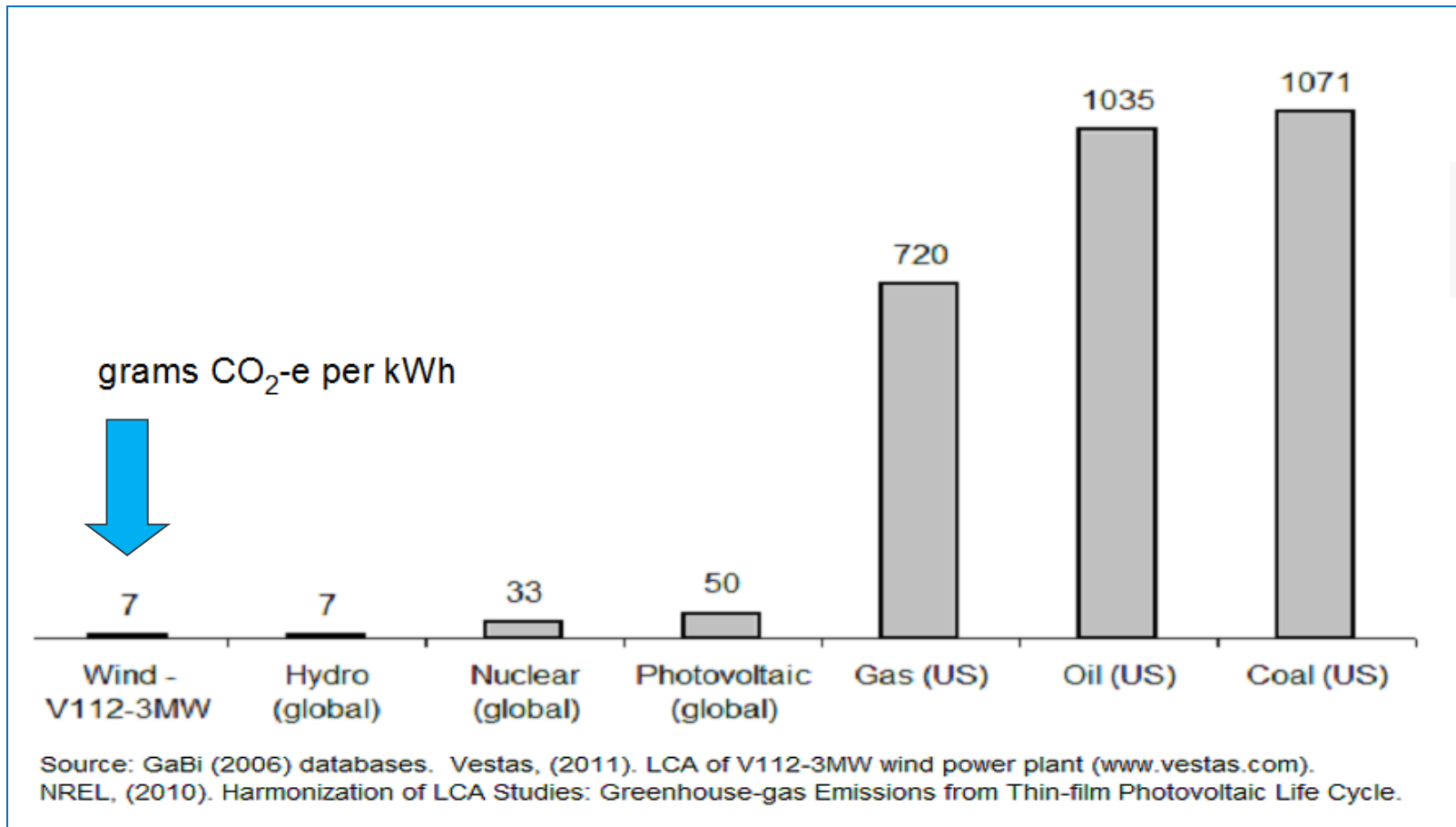
**As Wind competes for investment \$'s against other energy sources; from an EHS perspective, how does it compare to traditional electricity sources?**

- **CO2 footprint**
- **Return on Energy**
- **Water Consumption**
- **Recyclability**
- **Safety**

# Carbon Footprint

## Dramatically lower than traditional electricity

- At 7 grams CO<sub>2</sub> equivalents per kWh, a V112-3.0 MW turbine saves around 12 000 tonnes of CO<sub>2</sub> equivalents annually compared to coal generation

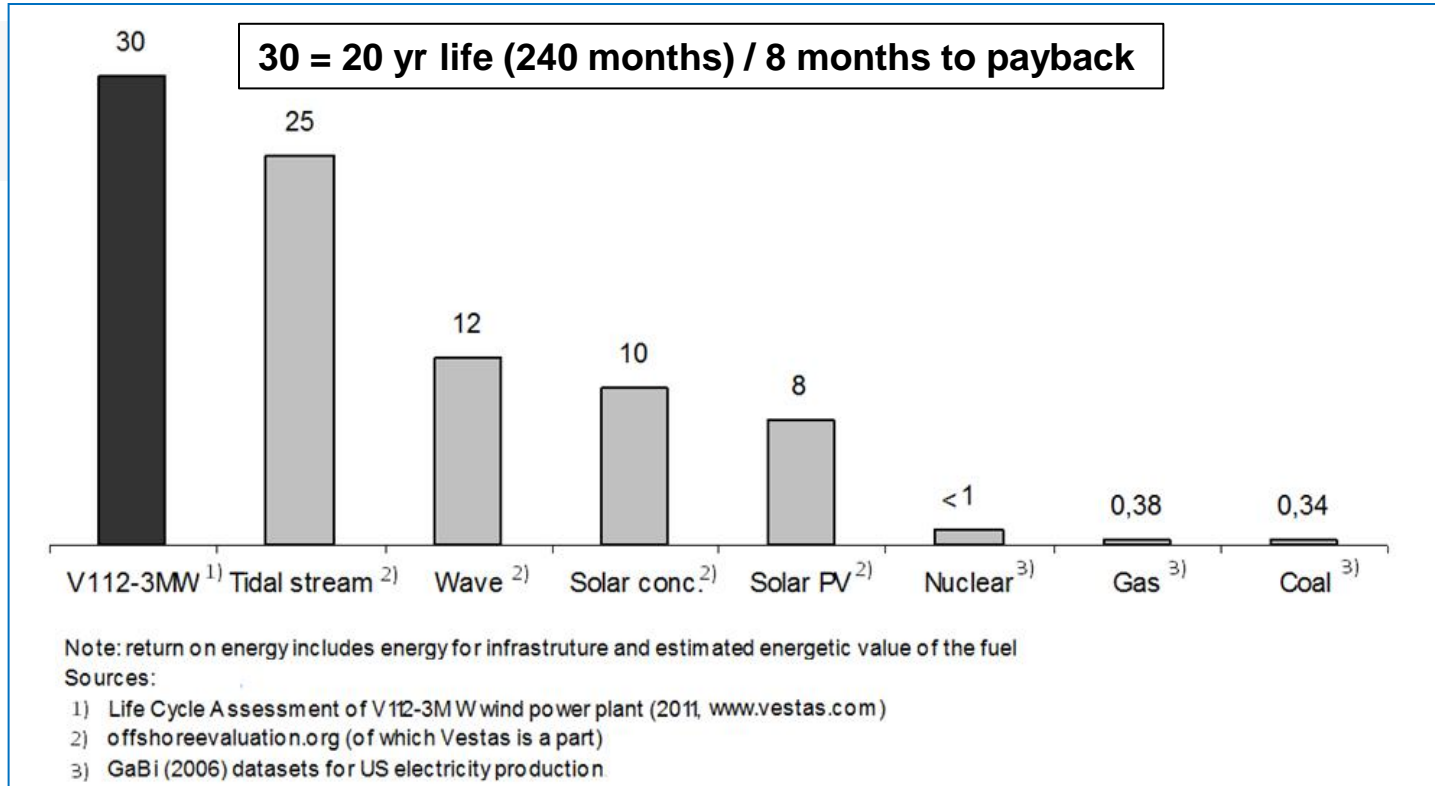


# Return-on-Energy

## Higher Return-on-Energy than traditional electricity

- Over its lifetime a V112-3.0 MW will produce 30 times more energy than it consumes (for every unit of energy used to produce the turbine, it delivers 30 units of energy back to society).
- After 8 months of operation the V112-3.0 MW has generated the equivalent amount of energy it took to produce it (in the whole life cycle)

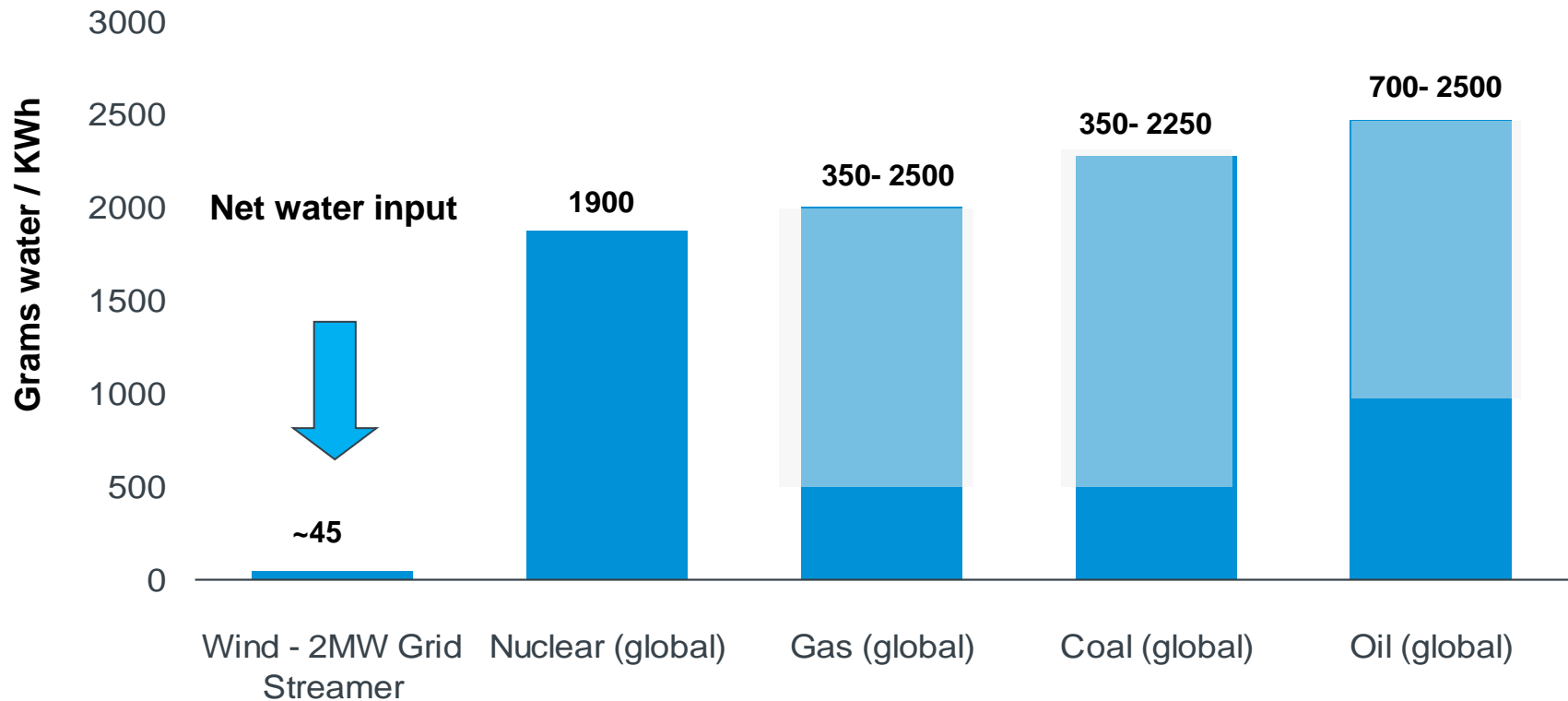
(Performance when operating at  $8\text{ms}^{-1}$  wind speed)



# Water Use

## Significantly lower water use than traditional electricity

- Over its lifetime a 2MW GridStreamer™ turbine uses around 10 to 70 times less water than traditional electricity.



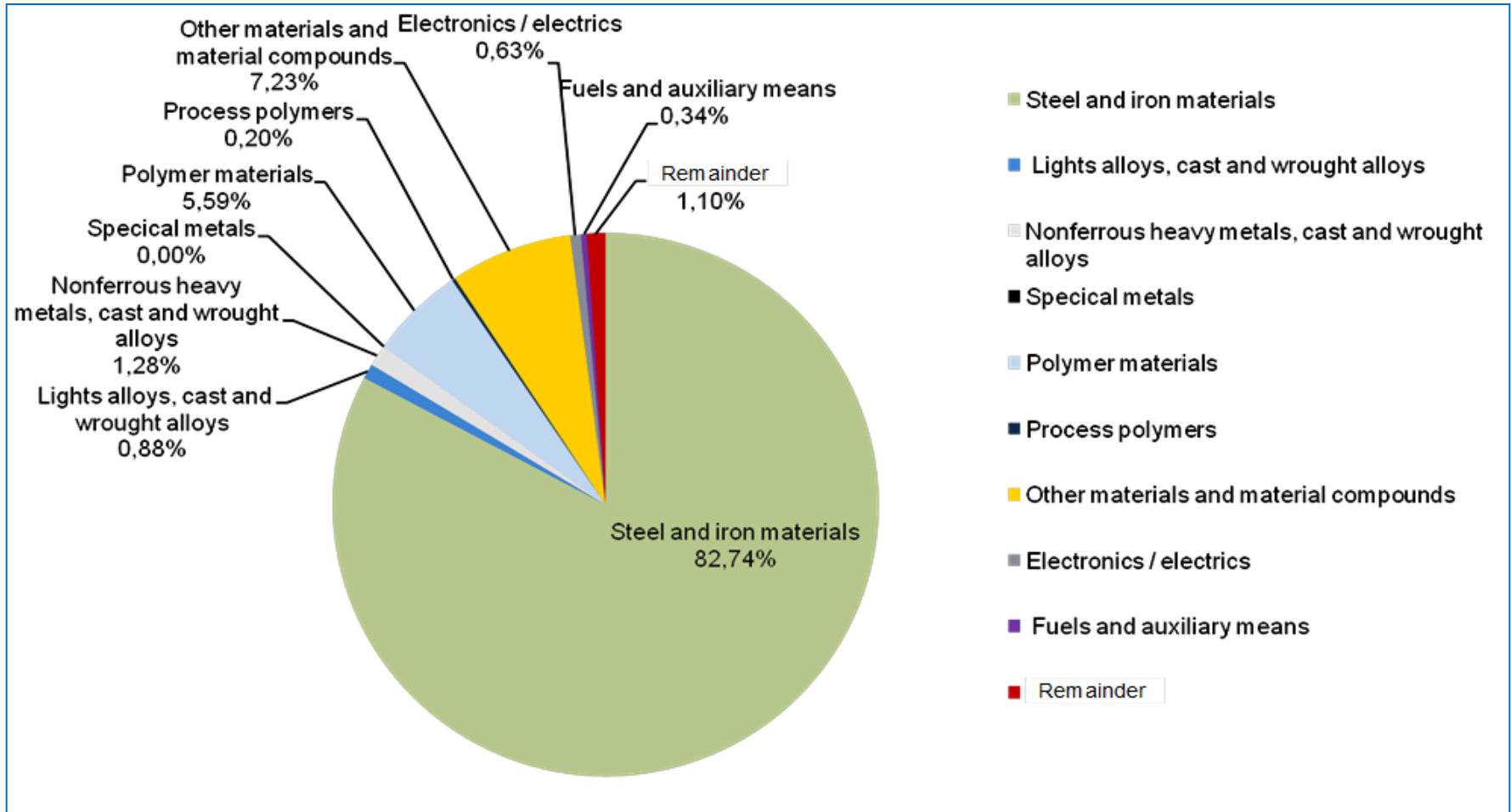
Source: Source: GaBi databases, 2006

Note: water-use refers to net water input over the life cycle of the turbine and does not refer to a water footprint (as being currently developed under the standards ISO 14046).

# Recyclability

## High Recyclability

- 80.9% recyclability for a V112-3.0 MW turbine
- Material breakdown of the turbine



# What About Safety?

- ❑ Wind has improved significantly, but industry specific data is difficult to find
- ❑ Injury rates compare to fossil fuel electricity sources
- ❑ US Wind Industry Safety collaboration is strong
  - Lead by AWEA Safety Committee and OSHA--AWEA Alliance
  
- ❑ However, to some, perception of Wind Safety remains negative
  - “Events” can be very visible (vivid pictures & video)
  - Those against Wind can use these “events” to influence perception



# Perception = High Risk, Dangerous, Un-Safe

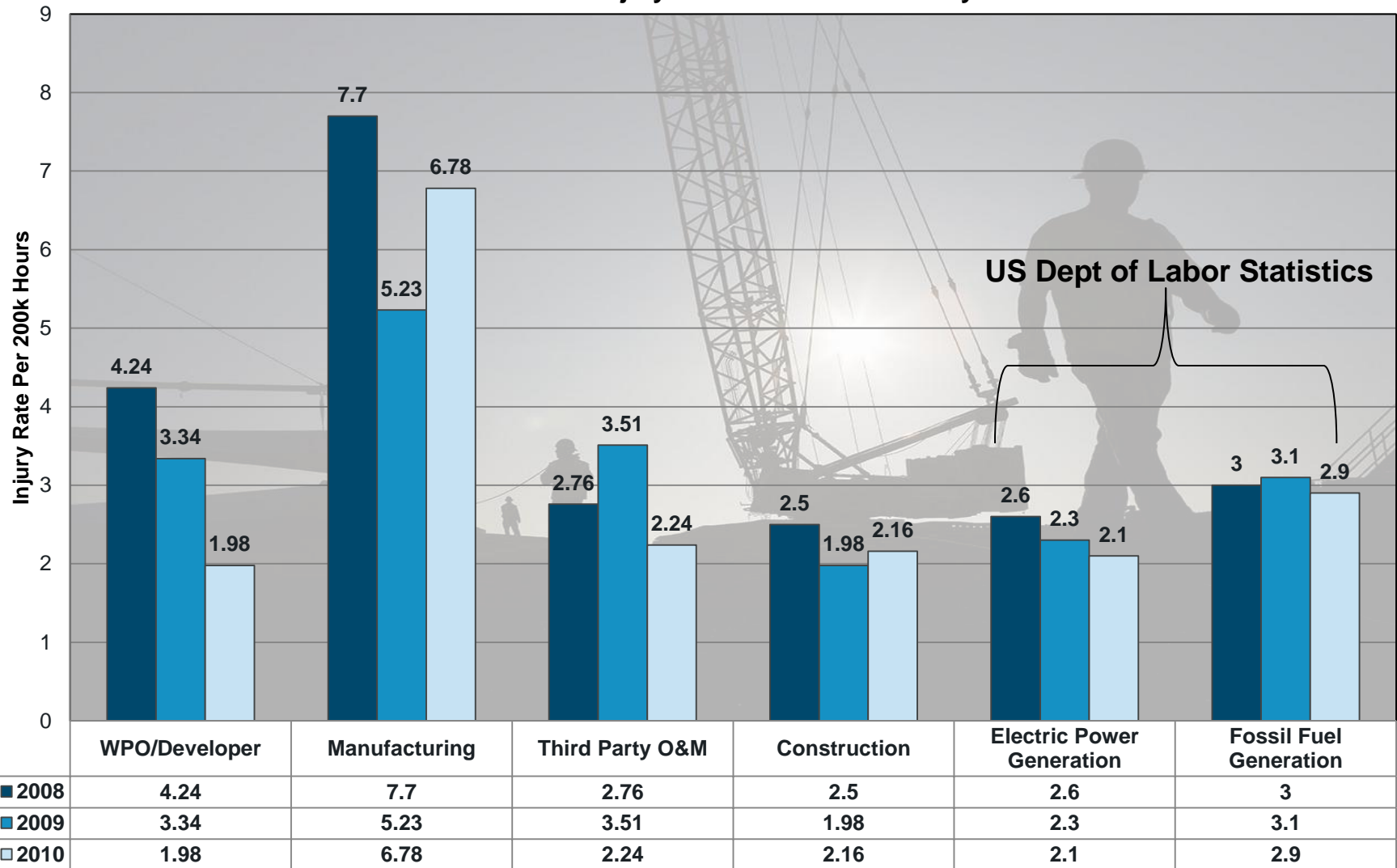




# Reality = In-Line with other forms of Power Generation

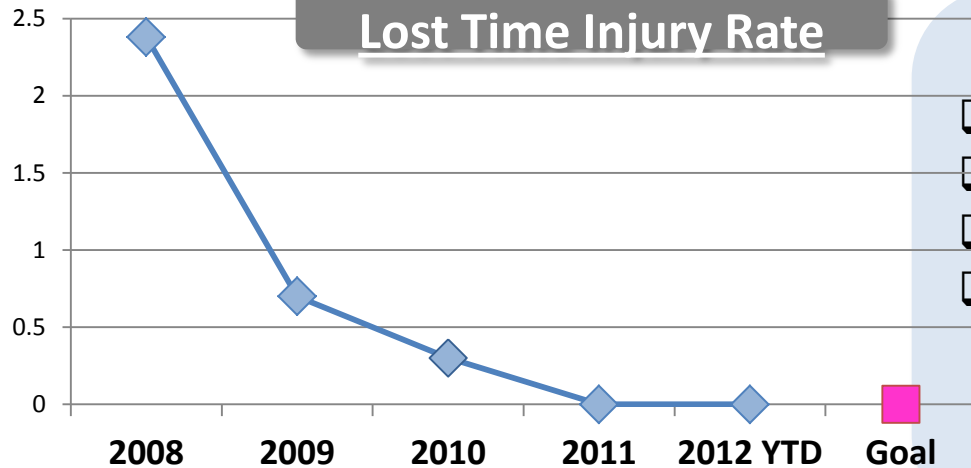
## AWEA 2010 Safety Survey

Total Recordable Injury Rate – US Wind Industry



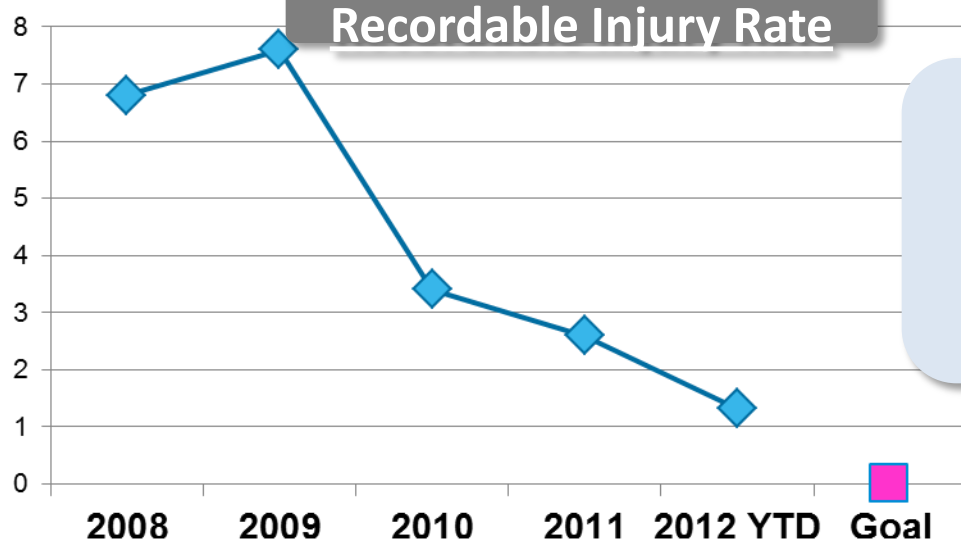
Sources = AWEA 2010 Safety Survey. US Dept of Labor Workplace, Injury, Illness & Fatality Statistics **Wind.** It means the world to us.™  
Rates per 200K hrs (**Caution that 2010 Survey is not a large industry sample**)

# One Example of Success (Vestas North America 2008-2012)



## The Journey

- ❑ 2008-09 Performance Poor
- ❑ 2009 Focus on policy & procedures
- ❑ 2010 Focus on Programs & Leadership
- ❑ 2011 Focus on Customer & Industry partnership/learning



## Keys to continued success

***Culture & Behaviors***

**Everyone, Everywhere, Every Day!**

# Issue and Opportunity

**Issue** = Negative Perception based on history and visible events

**Reality** = Performance relative to all power generation; although wind data difficult to obtain

**Opportunity** = leverage industry collaboration and partnership to make safety an Industry business advantage

- **Momentum exists** – *great strides in injury reduction have occurred*
- **Learning available** – *other mature industries have travelled this path...we can learn from their journey*
- **Industry collaboration in place** – *take advantage of it*

# Wind Industry Collaboration

## AWEA Safety and Health Council

- ❑ Steering Committee: representatives from all sectors of wind energy
- ❑ Subcommittee's:
  - OSHA Alliance Subcommittee
  - Construction Safety Subcommittee
  - Offshore Safety Subcommittee
  - Operations and Maintenance Safety Subcommittee
  - Training and Education Safety Subcommittee
  - Confined Space Task Force
  - LOTO Task Force
- ❑ Enhances relationships and learning across developers, construction, owners, manufacturer's, suppliers, operators along with public agencies and institutions

## OSHA – AWEA Alliance

WASHINGTON, D.C. (Aug. 8, 2011) – Indicative of both wind power's continued maturation and the importance the industry places on the safety of its greatest asset, today the American Wind Energy Association (AWEA) and the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) entered into an official Alliance to further protect the health and safety of the industry's workers.

***AWEA Press Release Aug 8, 2011***

# Summary

**From an EHS perspective, Wind measures very favorably to other sources of energy, with Safety as the largest opportunity for improvement**

- ☐ **Need to overcome negative perception**
- ☐ **Need to learn from mature industries**
- ☐ **Need to work together across the industry to drive improvement**

**Opportunity exists to make Safety a competitive advantage for Wind**

## What Can You Do

### **Make Safety a source of Pride for Wind:**

- Actively engage with AWEA Safety Committee
  - Complete the AWEA Safety Survey
- Hold each other accountable for injury free performance...accept nothing less as an industry
  - Elevate your expectations
  - Share Learning (good and bad)
  - Communicate your success (enhance our perception)

**Ensure Safety Measures-Up Favorably to  
just as other HSE factors do**



# Wind = Safe, Dependable, Clean, Sustainable

