# Reliability Factors
# Iberdrola Renewables

Kevin Devlin, VP Commercial Operations

IBERDROLA RENEWABLES

# *WHAT ARE THE KEY DRIVERS OF PERFORMANCE?*

# *QA*

- **Assumptions-**
  - Meteorology/Site Suitability
  - Availability Expectations
  - External Factors (interconnect)
- **Factory QA –**
  - Vendor screening
  - Factory-based QA staff
- **Site QA -**
  - Early hiring of ops staff
  - Contractor vetting
  - Collector design and implementation

*Its not just about the turbine……*

# *Feedback*

- **Continuous feedback to OEMs and Construction/ Development on operational issues.**

- ***Examples***

  - *Cold/Hot Weather Performance*
  - *Aerodynamics*
  - *Collector system issues (PD Testing)*
  - *Salt Water Environment*
  - *Ups/Backup Power Design*
  - *SCADA*

# *Technology*

- **Circulating current management (bearings and brushes)**
- **Increased filtration/Oil change frequency on gearboxes**
- **Battery and charger enhancements and re-engineering**
- **Alternative sourcing with improved components (sliprings)**
- **Environmental mitigation**
- **Security Systems**

# *People*

- **Focus on Training/ Capability Set**
- **Installation of Climb Assist/Elevators- US wide**
- **Prescreening of employees**
- **Correct incentives**
- **OEM maintain vs. owner**

***Safety is good business !***

# *Logistics*

- **Spares inventory is critical for reliability**
- **Consumption data and min/max order points**
- **Regional warehouse system**
- **Collector system spares**

# *Metrics*

- **Is availability a good metric for an owner?**
- **Reliability = Availability within a set wind speed- For Example [5<WS<25]**
- **Efficiency Metric (Met Tower)**
- **Met Tower – Reliability**
- **Parts Consumption**
- **Energy Corrected Output**

# *Forecasting*

- **ISOs Raising the bar across the Country on scheduling/forecasting**
- **BPA Integration is near term example**
- **Responding to issue**
  - 24/7 Meteorology Team
  - Enhanced Control Technology
  - Operations and Real Time trading integration

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## Thank You

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