



**Viryd**<sup>TM</sup>  
Technologies

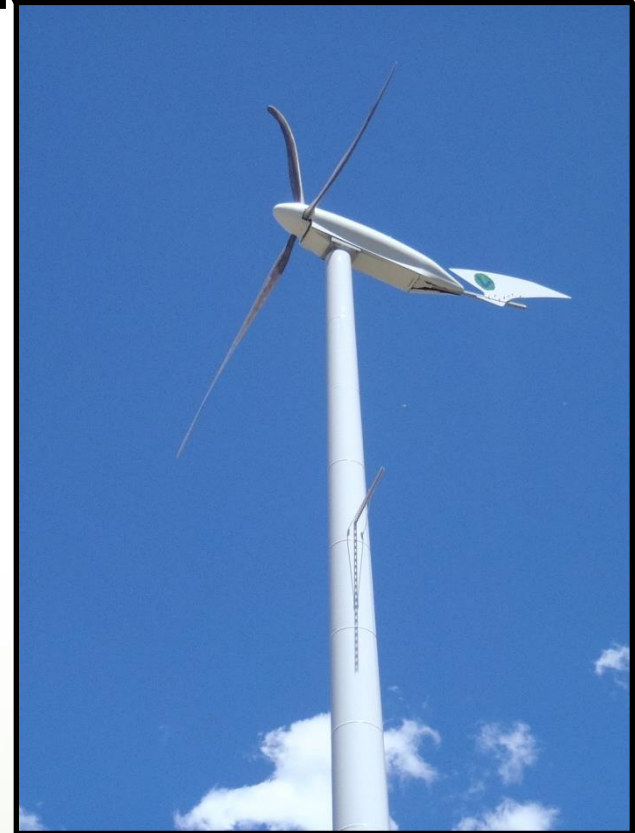
**Viryd Technologies Overview & Installation  
for  
IIT University-Industry Consortium  
Wind Energy Research,  
Education, and Workforce Development**

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**July 20, 2011**

# Viryd Technologies Overview

- Company was formed in 2007 from Fallbrook Technologies ([www.fallbrooktech.com](http://www.fallbrooktech.com))
- Fallbrook developed and commercialized a Continuously Variable Planetary Transmission (CVP) – NuVinci™
- Viryd focus on application and commercialization of a CVP in a wind turbine
- **Viryd Company Focus:**
  - Design Turbines and Components
    - Use Analytical Modeling Tools
    - Validate system function with Bench Test
    - Test complete system in field
  - Develop integrated controls for turbine and CVP
  - Assemble and test systems
  - Develop Product Range
  - Integrate Renewable Energy Systems



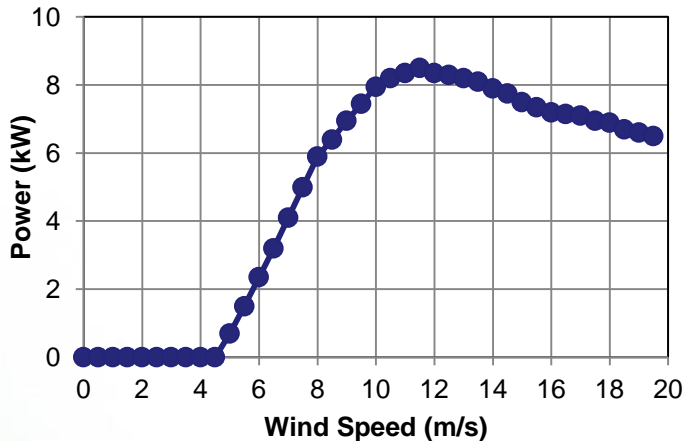
# 2011 Viryd Product Family

Product Breadth – 8kw, 10kW, 30kW, 50kW

	Constant Speed	Variable Speed
8KW	X	NuVinci
10kW	X	NuVinci
30kW	X	
50kW	X	



8 kW Constant Speed, 60 Hz

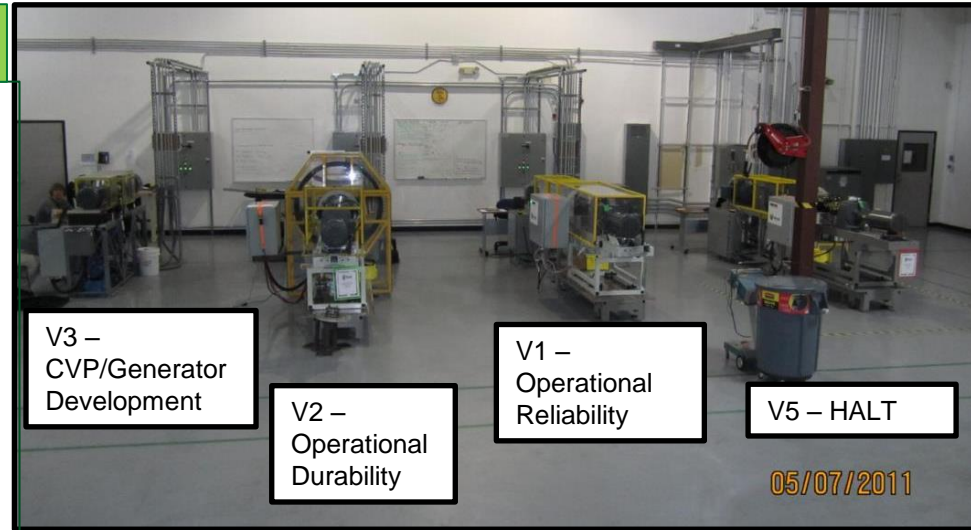




# Viryd Bench Test Capability

## AUSTIN, TX FACILITY: TEST AREA

- CVP Development
- Durability Testing
  - ✓ > 8,000 hours of Bench Test hours (DV& PV)
  - ✓ > 2,200 operating hours of field test
- Reliability Testing
- Highly Accelerated Life Testing



## ILLINOIS INSTITUTE OF TECHNOLOGY

- Fully Instrumented and Designed for Illinois Institute of Technology (IIT)
- Funded by a Dept of Energy (DOE) Grant
- Per DoE: “One of the most comprehensive education and training tools for wind in the industry today”



# Viryd - IIT 8kW Field Unit Installation

## ILLINOIS INSTITUTE OF TECHNOLOGY

- **Funded by a Dept of Energy (DOE) Grant**
- **8kW Single Phase Wind Turbine - Upwind**
  - **Induction Generation**
  - **Custom Designed 4m Stall-Regulated Blades**
- **80' Hydraulic Monopole Tower**
  - **Maintenance Down Tower**
  - **No Crane Required**
- **Project Timeline:**
  - **Building Permit Initiated November, 2010**
  - **Building Permit Granted, June 9, 2011**
  - **Two Weeks of Rain Delay**
  - **System Completed/Signed Off, July 19, 2011**



***City Permit Process: 8 Months vs Wind Turbine On-Site Installation 3 Weeks***



# Installation Chronology



**Excavation: 6/19**



**First Rain: 6/22**

**Con't Rain  
through 6/27**



**1st Pour: 6/29**



**1st Pour: 6/29**



**2nd Pour: 6/30**



**Final Pour: 07/01**



**Electrical & Boring: 07/05**

# Installation Chronology Con't



Base: 07/11



Tower Base & Bottom: 7/12



Tower Top Section: 7/13



Turbine on Tower: 7/14



*Moving  
Energy  
Forward.....*

*IIT and  
Viryd Technologies*

*July, 2011*