



Ryse Energy

Oil and Gas – Hybrid - 2024
AIR RANGE
Ken Kotalik





RYSE ENERGY WIND TURBINE PORTFOLIO


Our distribution of wind generation technology covers the main four classes of wind turbines within the small to medium range

Class 1: Up to 10 m/s average wind speed

- E-20** 
- Rated Power: 18kW
 - Maximum Power: 20kW
 - Primary Applications:
 - Agricultural
 - Industrial
 - Community Power

- E-10** 
- Rated Power: 10kW
 - Maximum Power: 20kW
 - Primary Applications:
 - Agricultural
 - Industrial
 - Community Power


- E-5** 
- Rated Power: 4kW
 - Maximum Power: 5.5kW
 - Primary Applications:
 - Telecom
 - IoT & ICT
 - Oil & Gas

- E-3** 
- Rated Power: 1.9kW
 - Maximum Power: 3.0kW
 - Primary Applications:
 - IoT & ICT
 - Telecom

Class 2: Up to 8.5 m/s average wind speed


- E-60** 
- Rated Power: 60kW
 - Maximum Power: 70kW
 - Primary Applications:
 - Industrial
 - Community Power

Class 3: Up to 7.5 m/s average wind speed

- G-11** 
- Rated Power: 11kW
 - Maximum Power: 13kW
 - Primary Applications:
 - Agricultural
 - Community Power
 - Remote Locations

Class S

- ONSHORE** 
- Models: AIR 30, AIR 40, AIR MaX
 - Monthly Energy at 5.5 m/s:
 - AIR 30 & AIR MaX: 30 kWh/mo
 - AIR 40 : 40kWh/mo
 - Primary Applications:
 - O&M – Telecom
 - Residential
 - Educational

- OFFSHORE** 
- Models: AIR Silent X, AIR X Marine, AIR Breeze
 - Daily Energy at 5.5 m/s:
 - AIR Silent X, AIR X Marine: Approx. 90 amp-hr. per day
 - AIR Breeze: Approx. 95 amp-hr. per day
 - Primary Applications:
 - Industrial
 - Sailing - Residential

Ryse Energy the most diverse portfolios of wind technologies in the sector

This enables us to deploy the best suited technology for client-specific requirements, while maximizing energy output.

Class 1 wind turbine technologies can operate across all three classes but are robust enough to operate in the harshest of wind conditions.



OIL AND GAS OFF-GRID, HYBRID SYSTEMS

AIR WIND TURBINES

Ryse Energy AIR Wind Turbines are proudly Made in the USA (Houston, TX)

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- AIR was introduced in 1995
- Total sales of over 180,000 units over 28 years
- 200-400W 12-48V
- Today's models benefit from decades of improvements, upgrades and technological advancements



PROVIDING HYBRID RENEWABLES TO REMOTE CRITICAL OIL&GAS LOADS – CASE STUDY AIR30 – 400 W

The AIR unit has been deployed in off grid/battery backup applications in the Oil and Gas market for many years to compliment Solar to maintain battery voltage under load. As these sites are often remote and critical loads, the additional charging source of a wind turbine, to compliment solar (Hybrid system), for nighttime power production, and adverse weather conditions (storms) are ideal conditions to support consistent battery charging with wind.

Location - West Texas

OFF GRID and GRID TIE BATTERY BACKUP

Customer - DEVON ENERGY

Midstream Operation - SCADA Communication, switching and Pump controls

SCH 40 Guyed Tower - 27ft.

Hybrid System with 300 W of Solar

Typical system is 800-1000 W Hybrid

400-600 Ah battery at 24V – Sealed Lead Acid

Total WIND Installed cost (no labor) - \$1500 – Single AIR Turbine



WHY DEPLOY WIND (Hybrid System)

O & G Problem:

- Batteries voltage low – LVD initiated (typically in winter)
- Solar insufficient to power loads (winter months)
- Too few days of Autonomy in design – less than 3
- Adding loads after initial system install without increasing solar/batteries – poor system design

Result:

- Battery replacement after 1 year or less due to high sulfation (typically in winter months)
- High cost for O & M budget - field service – batteries and overtime - typically in winter and poor weather conditions/nighttime
- Loss of SCADA COMMS
- Down Time – loss of productivity

Solution:

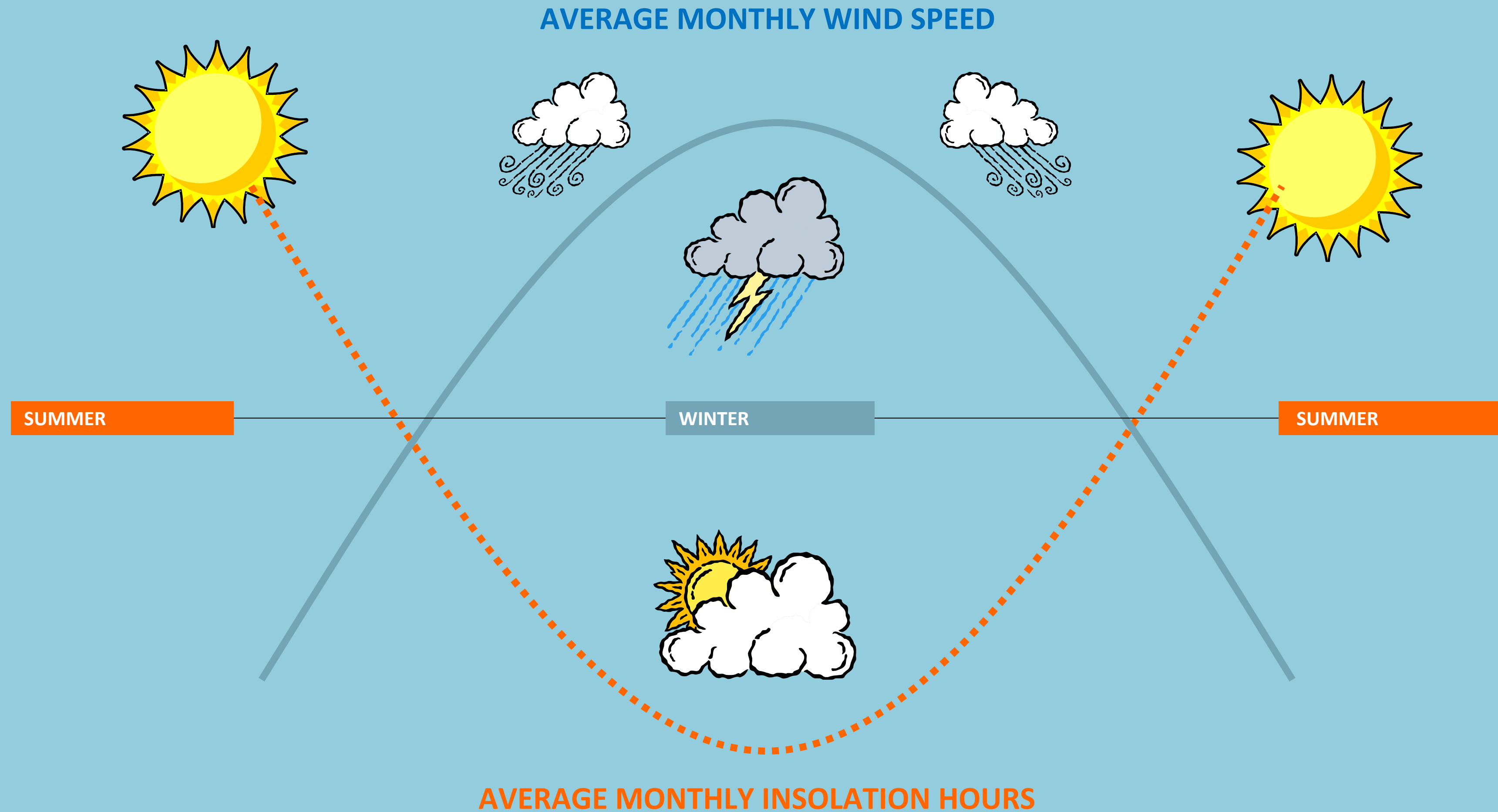
- Hybrid System integration - extended battery life and performance of the system

No TAX Incentives to deploy – MADE IN USA – Minimal Maintenance - “set it and forget it”

Easy Installation - Up tower Controls - wire direct to Batt Bank



HYBRID SYSTEMS ARE COMPLIMENTARY

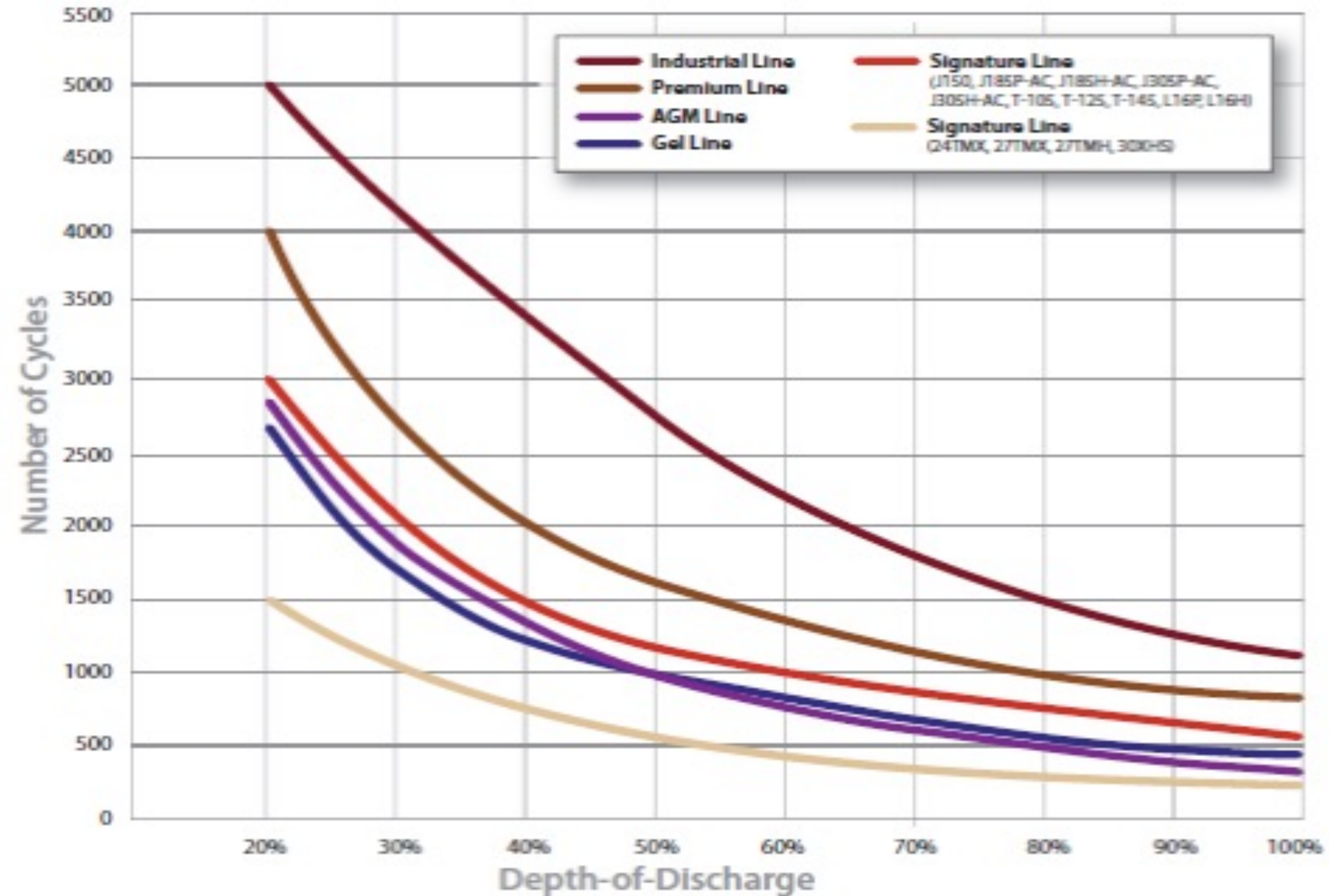


WHY HYBRID SYSTEMS ARE BETTER

Enhance Battery Performance

Cycle Life Chart

The single most important factor to consider when purchasing a deep-cycle battery for a renewable energy application is cycle life. The cycle life rating is the number of discharge/charge cycles the battery can provide over its lifetime. This will allow you to determine the true value of the battery over its life by understanding the total cost of ownership. This chart illustrates the cycle life ratings for the Trojan lines of deep-cycle batteries for renewable energy applications.



HYBRID SOLUTIONS MAXIMIZE BATTERY LIFE

If nightly discharge rates are reduced, battery life will be extended.

Pulse Charging decreases sulfation.



KEEP THE BATTERIES HAPPY

Interesting Positive Result (surprising): AIR turbines in Oil and Gas (Industrial Sites) are often installed in highly turbulent environments at well site. Short towers, poor siting and obstructions are common but typically installed in high Winter wind speed areas.

Therefore, turbine experiences high YAW rates, high wind gusts resulting in extreme current fluctuation.
PULSE/BURST CHARGING



Pulse Charging - ROLLS BATTERY TECH SUPPORT – June 3 - 2020

Pulse charging may be chosen as a preventative measure to reduce a long-term buildup of sulfation. When used from the initial installation, pulse charging may be effective in reducing sulfation buildup in cells that are properly charged and maintained.





*VERSATILITY,
RELIABILITY & VALUE*

*LEADING THE WORLD
IN SMALL SCALE, OFF-
GRID WIND TURBINES*



“Those little rascals just work, charging up the batteries and keeping me home at night for dinner!”

CHK Field Service Tech – Carrizo Springs, TX



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