
Making Small Wind
Economically Viable
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DUCTED
WIND TURBINES
1
Q3 2020

The Problems

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- Small wind turbines are not economical
  - High turbine cost for power output
  - Long term paybacks (15-20 years)
  - Not competitive with solar LCOE
- Expensive & difficult installation
  - Tower heights of 100', expensive foundation
  - Not optimized for low wind speeds
  - Crane often required for installation
- Result: *Lost investment, orphaned products*

The Solution

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The Aft Rotor Ducted Turbine

- Economical Wind Power
  - 2X the energy of open rotor design
  - Half the size of open rotor design
  - Payback – 9 years
  - LCOE – $0.18
- Easy Assembly/Installation
  - Assemble at site
  - 40’ Height, tilt down tower (no crane)

Facilitating Hybrid Systems

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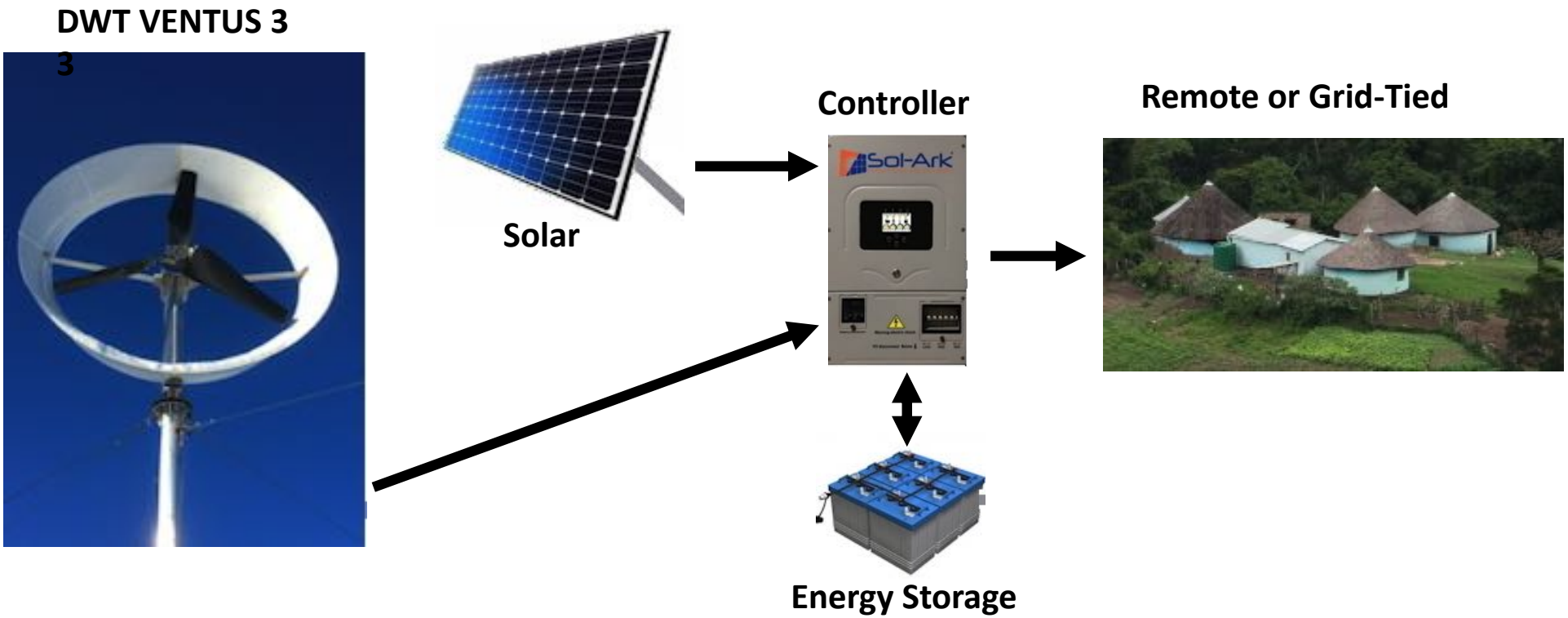

- Adding wind to solar reduces battery size significantly
- Constant battery charging vs. daylight only
- Dual channel controller accommodates wind & solar

Why Are We Different?

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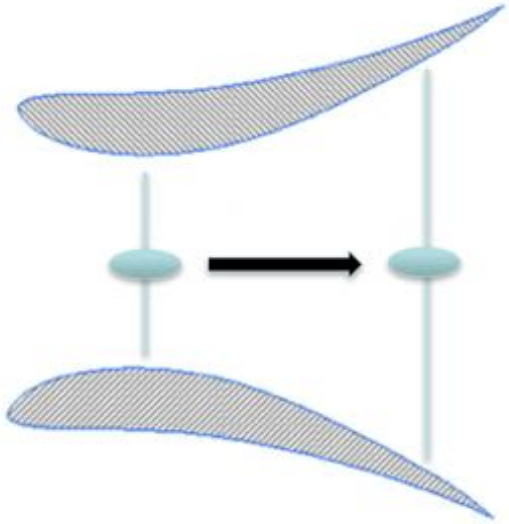
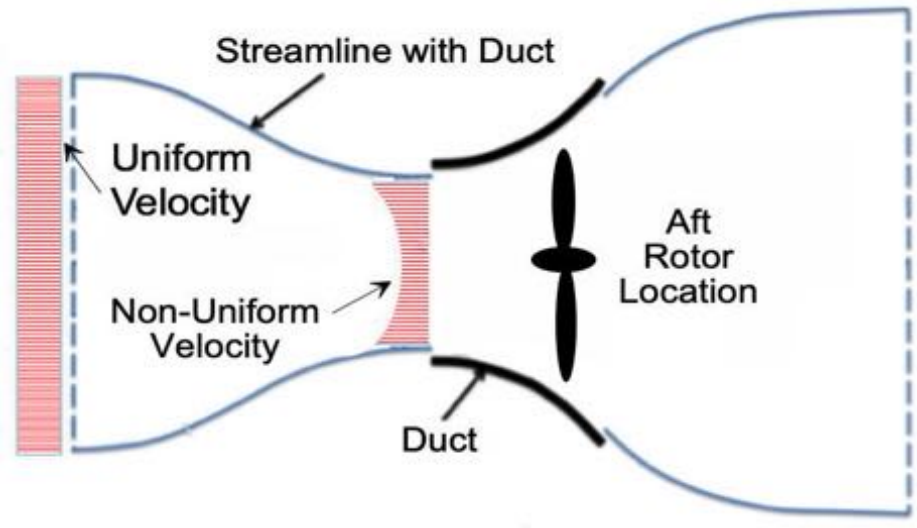


Aft Rotor



Synergistic Design

Patent No.: 10,563,635 issued

Global Exclusive License of Clarkson University IP

Kanya and Visser, 2018 (www.wind-energ-sci.net/3/919/2018/)

Why DWT Will Succeed

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‘IKEA Style’
Turbine in a Box

- ***Economically viable***
- ***Drop ship it anywhere***
- ***Ease of assembly & install***
- ***Flexible dual inverter***
- ***Multiple market applications***
- ***Strong competitive positioning***
- ***Augments solar & diesel***

Competition

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Competitive Comparison	DWT Ventus 3*	Bergey 10 kW	SD Wind SD6	Halo
Rotor Diameter	3 m	7 m	5.6 m	2.4 m
Annual Energy Output (kW/Yr @ 5 m/s)	7,000	13,800	8,950	6,700
Installed Cost	$18,000	$71,000	$48,000	$ 40,000*
Payback (years)	9	18	24	21
LCOE ($/kWh)	$0.18	$0.32	$0.43	$0.39
Installed cost/watt	$2.57	$5.14	$5.36	$5.97

* Assumes 5 m/s wind speed. At 6 m/s, the AEO is 10,000, the LCOE is $0.13/kWh, and the payback is 6.6 years
** estimate

DWT Ventus 3

Bergey 10 kW

SD Wind

Halo 6.5 kW

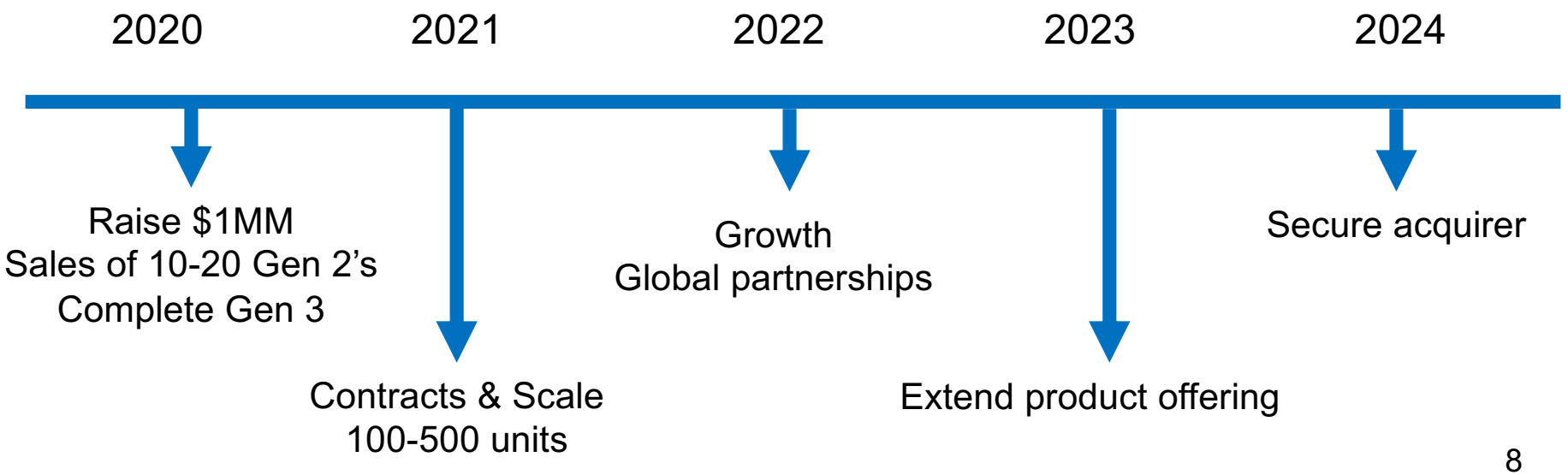
Business Model

Lean, Capital Light Mfg.

“Turbine in a Box” Design

Installation Partnerships

Timeline



Target Market Growth

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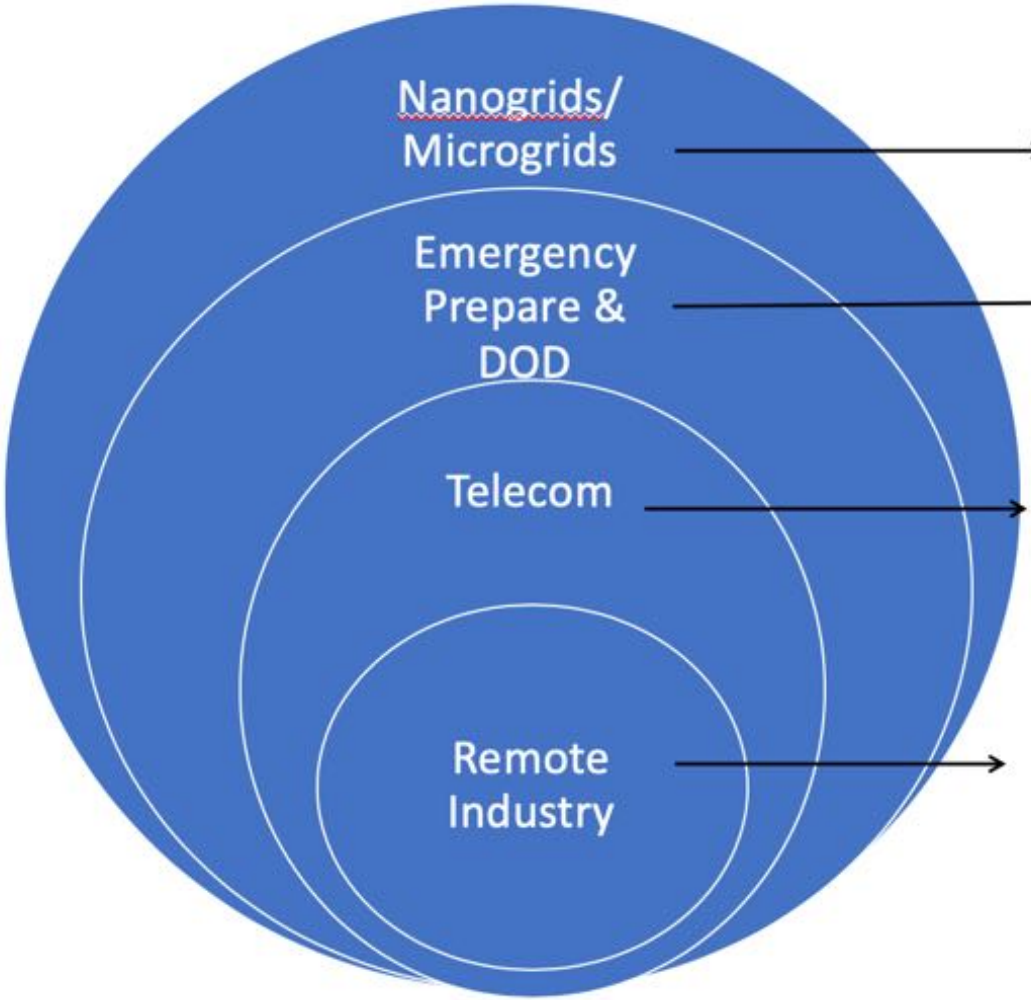

Nano/Microgrid Global Market to reach **$31.2 Billion** by 2022.

Portable Military Energy Market; **$6.13 Billion** by 2024.

Telecom Power System Market to be worth **USD $5.11 Billion** Globally By 2024.

Global Remote Industry renewable energy market worth **$14.94 Billion** with a 10.9% CAGR growth by 2026.

Addressable Market – 5 Years

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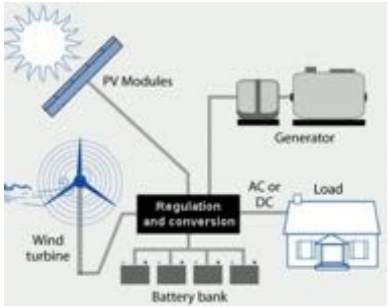
Nano-Grids & Micro-Grids	• 5,000 Turbines • $75MM
Other Off-Grid & Emergency Prep	• 2,000 Turbines • $30MM
Telecom - Off-Grid Towers	• 3,000 Turbines • $45MM



5 Year Projection: 10K Turbines = $150-200MM Opportunity

The Team

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Dr. Ken Visser (CTO)
Co-Founder

Aero Engineer
(NASA, Boeing)

Clarkson Professor
Small Wind Research.

Paul Pavone (CMO)
Co-Founder

Former Manager
URS Corp./AECOM

Joe Dickson, (CEO)
NYSERDA EIR

Financial Advisor
Veteran high-tech,
clean-tech entrepreneur

Advisors

- **Ken Camarco,** Manufacturing Advisor, Clarkson Trustee, Global Mfg. Experience.
- **Doug Buerkle**, Renewable Energy Advisor, formerly w/NYSERDA, NextCorps
- **Mike Derrick,** Strategic Advisor, Col. US Army (retired), West Point

Accomplishments & 2020 Goals

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2019 Achievements

- Gen 1 unit at Clarkson (4/19)
- NREL CIP grant $200K
- Other grants: $200K
- Convertible debt: $300K
- Patent issued / Technology licensed
- LOI – 100 turbines in 2021-2022
- RFP – 200 turbines in 2021

2020 Goals

- Sell & install 10-20 Gen 2 turbines
- Establish operations & staff outside of Clarkson University
- Complete development of the Gen 3, commercial turbine
- Secure partnerships with large corporations for contract sales
- Establish outsourcing network & supply chain for Gen 3 components

Ask & Expected Return

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- Current $750K convertible debt round still open
  - $275K subscribed, $475K available
  - Min. $25K
- Possible follow-on $500K round in 2021
- Use of proceeds:
  - Complete Gen 3 Commercialization
  - Business Development & Partnerships
  - Operations
- Exit Strategy: Acquisition in 3-5 years

Improving Life – Reducing GHG

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Making the world a better place with Remote, Renewable, Reasonably priced electricity

"Electricity – You Can't Fight Poverty Without It!"

(John Keane – February 2019)