

DOCKETED

Docket Number:	16-EPIC-01
Project Title:	EPIC Idea Exchange
TN #:	221638
Document Title:	Introduction of Micro Wind Turbine Technologies to the Micro Grid
Description:	N/A
Filer:	System
Organization:	Joseph E. Gabunilas
Submitter Role:	Other Interested Person
Submission Date:	10/30/2017 7:26:00 AM
Docketed Date:	10/30/2017

Comment Received From: Joseph E. Gabunilas

Submitted On: 10/30/2017

Docket Number: 16-EPIC-01

Introduction of Micro Wind Turbine Technologies to the Micro Grid

American Wind Inc. based out of Huntsville, AL would like to introduce their Micro Wind Turbine Technology and Portable Energy Power Source system as a solution for establishing Micro Grids in the State of California.

From installation use to emergency response to forward operating base, the MicroCube™ is converted to an Expeditionary Portable Power Unit in the form of a Portable Energy Power Source (PEPS). PEPS is a trailer system with a one hundred (100) kilowatt hour (kWh) battery system, ninety-eight (98) kilowatt (kW) wind turbine system, multi-system charging ports including: dual generator ports, shore power conditioner and solar panel inputs. While maintaining a small portable footprint, the PEPS' built-in wind turbine system will allow extended operation time without the need of fuel based support or logistical support thus improving resiliency and installation security on all levels.

Additional submitted attachment is included below.

2017



AMERICANWIND

Power to the People

INNOVATION

to meet the United States needs

Providing resilient and secure power.



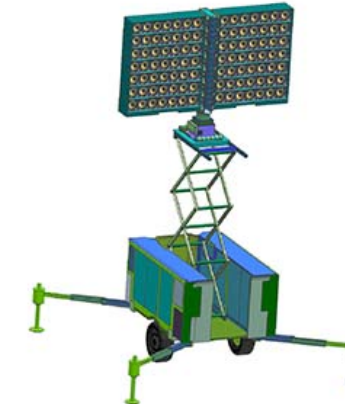
MEETING GOVERNMENT ENERGY REQUIREMENTS

American Wind's Products and Solutions are mission enablers, reduce future resource risk, and increase mission assurance by:

- Providing Resilient and Secure Power
 - Going where Others Cannot Go
 - Producing where Others Cannot Produce
 - In microgrids, fill in the gap where solar fails
- At Home or Abroad, providing consistent, storable energy in a flexible, configurable, deployable manner
- Having an Extremely Short Payback Period
- Requiring Minimal Maintenance / Minimal Training
- Creating Minimal Noise and Heat signature
- Having Negligible Safety Risk and Environmental Impact Risk
- Being Bullet Resistant

AMERICAN WIND PRODUCTS

OVERVIEW



	MicroCube™	WindWall™	Advanced WindWall™	PEPS (Portable Energy Power Source)	MicroSphere™
Max Output	1 kW	50 kW	100 kW	98 kW	1 kW
Size	9"³	96" x 48" x 36"	96" x 120" x 24"	86.3" x 120" x 90" * 86.3" x 120" x 156" **	14"
Weight	9 lbs	500 lbs	900 lbs	3,000 lbs	10 lbs
Portable	Yes	No	No	Yes	Yes
Battery onboard	Available / Not Standard	Available / Not Standard	Available / Not Standard	100 kWh	Available / Not Standard
Min/Max Wind speed	1.5 - 140 mph	1.5 - 140 mph	1.5 - 140 mph	1.5 - 140 mph	1.5 - 140 mph
Min/Max Temperature	-15°F to 375°F	-15°F to 375°F	-15°F to 375°F	-15°F to 375°F	-15°F to 375°F

* - Container Configuration; ** - Travel Configuration

AMERICAN WIND ADVANTAGES

SIZE

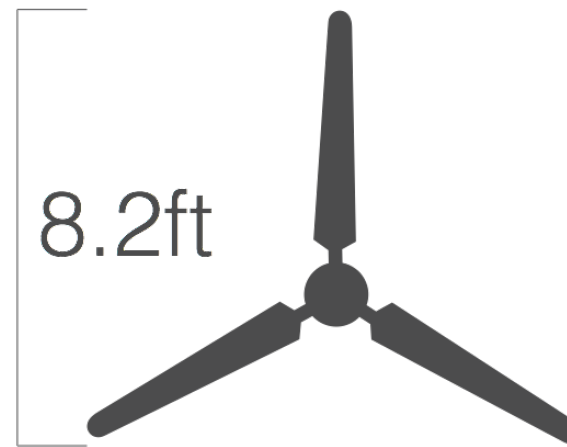
9in



MicroCube 1kw turbine



Nova New Energy 1kw turbine



Bergey XL..1 1kw turbine



SAIAM 1kw turbine

Traditionally, one kilowatt (kW) wind turbines do not have a micro foot print. Despite being called a micro wind turbine, traditional turbines are typically six feet plus in diameter. This truth makes portability and alternative configuration unlikely.

American Wind, Inc's MicroCube™ does not share the flaws of traditional systems. Sized at nine inches in all directions, the MicroCube™ is portable, modular, and configurable to meet mission requirements.

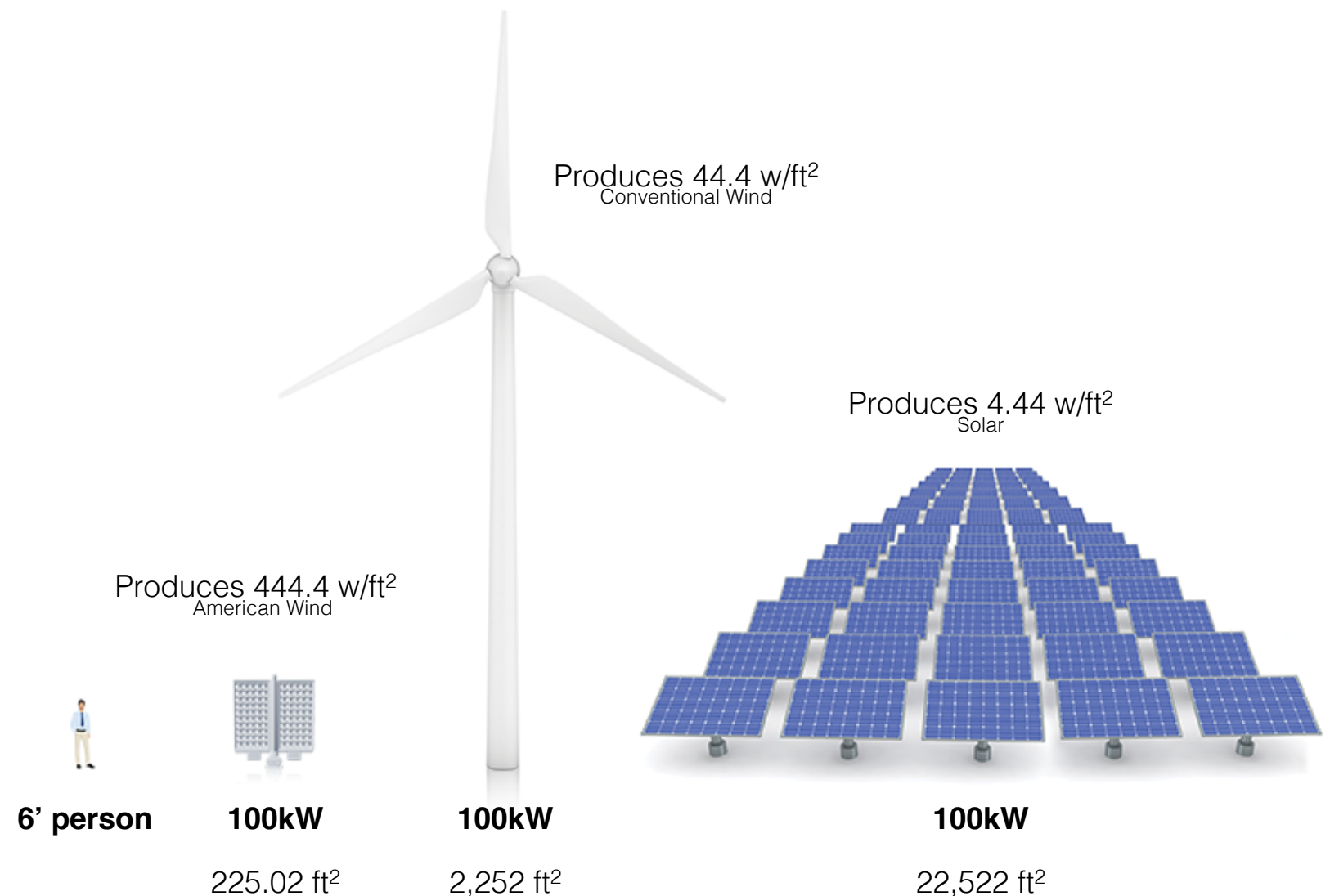
AMERICAN WIND ADVANTAGES

SIZE COMPARISON

Watts per square foot size comparison

Conventional renewable energy systems produce large amounts of power but at the expense of utilizing large amounts of space. This limitation found in conventional systems reduces its applications.

When comparing systems of equal electrical output, the vast difference in American Wind, Inc's technology is easily seen.



*kW - Kilowatt

*w - watt

AMERICAN WIND ADVANTAGES

WIND SPEED

Watts per square foot size comparison

How much power can be produced per square foot of space? This is where American Winds products/solutions shine: producing 10x the power per square foot as conventional wind turbines and 100x the power per square foot as solar.

To generate 3 megawatts of power, how big would the energy system need to be? Here is scale representation using 67,500ft² soccer fields. How much land is available for use?

Solar produces 4.44 w/ft²

Conventional Wind produces 44.4 w/ft²

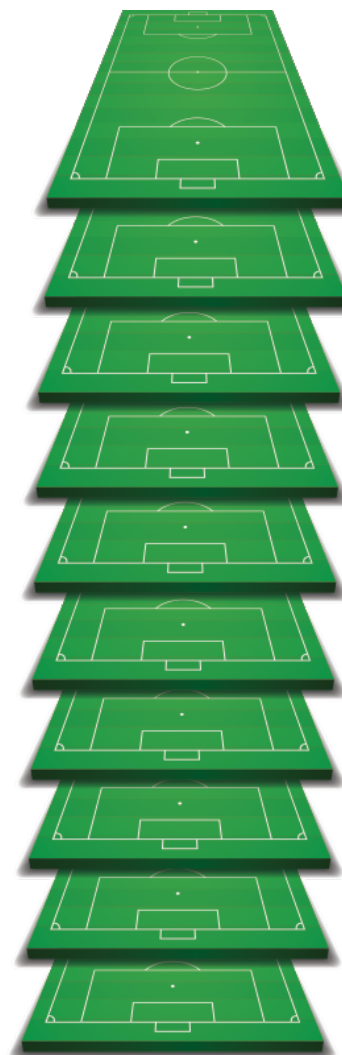
American Wind produces 444.4 w/ft²

**MW - Megawatt*

**kW - Kilowatt*

**w - watt*

3 MW - Solar



3 MW - Conventional Wind



3 MW - American Wind



AMERICAN WIND ADVANTAGES

RETURN ON INVESTMENT (ROI)

- ROI from 1.3 yrs at Max Wind Speed and 7.7 yrs at 11 mph
- 30 year life
- Extremely Low O&M
- Short Training Period

kW generated per year

	MicroCube™	Aeolos-V	KrestrelWind e300	Bergey 1kW	Bergey 7.5kW
3mph	403	0	0	0	0
5mph	675	0	0	0	0
11mph	976	1314	69	48	254
Maximum	8760	8760	8760	8760	65,700

Return on Investment

	MicroCube™	Aeolos-V	KrestrelWind e300	Bergey 1kW	Bergey 7.5kW
@3mph	\$88.65	\$0.00	\$0.00	\$0.00	\$0.00
@5mph	\$148.39	\$0.00	\$0.00	\$0.00	\$0.00
@11mph	\$325.70	\$298.00	\$269.81	\$235.12	\$1349.04
ROI @11mph	7.7	10.72	12	19.5	19.1
Max Wind Speed ROI	1.3	4.7	4.8	5.5	2.5

AMERICAN WIND ADVANTAGES

WIND SPEED

Going where others cannot go; producing where others cannot produce.

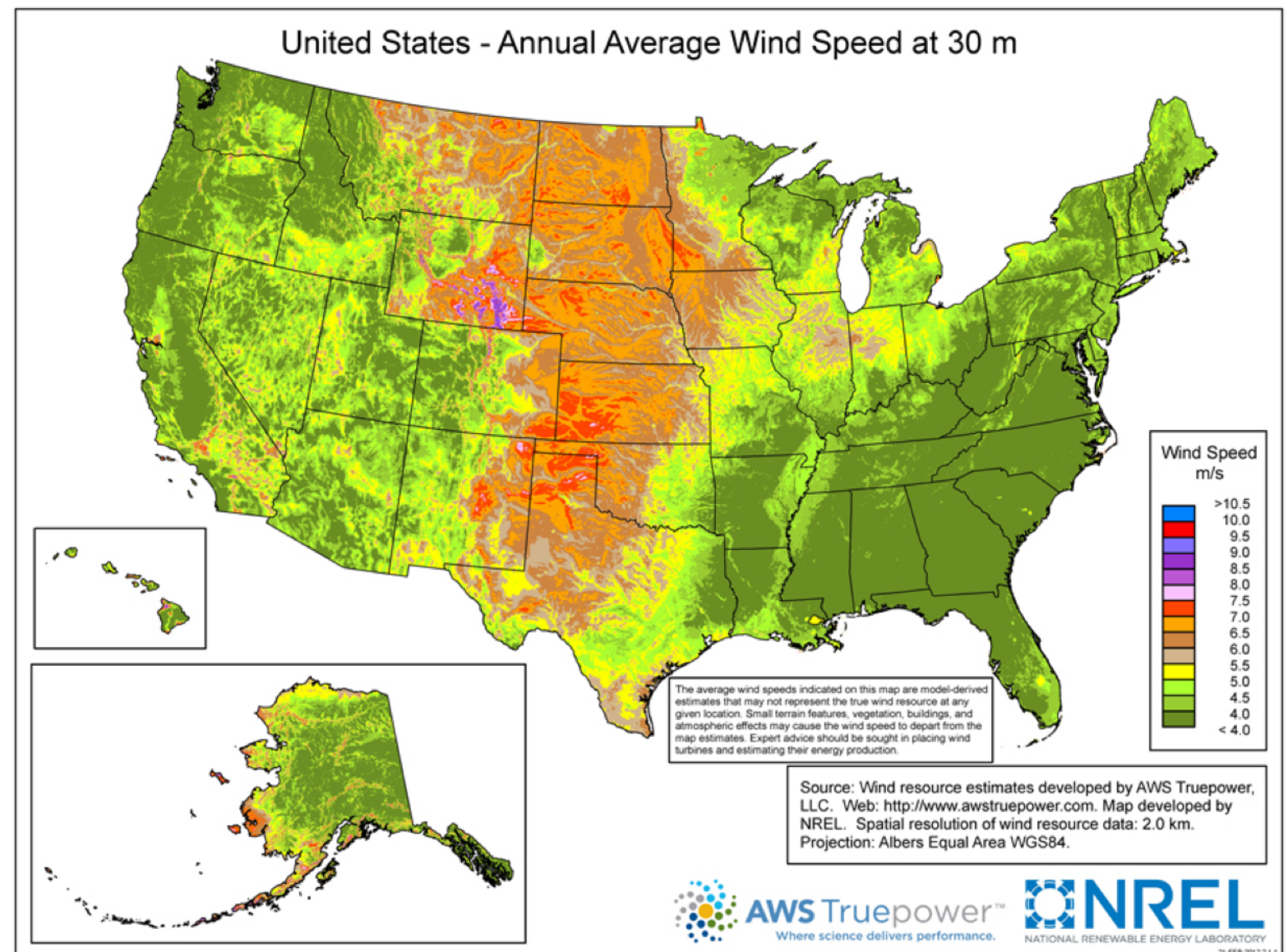
American Wind's products and solutions were designed to work in wind speeds of 1.5 mph and higher. Utilizing a cut in speed of 1.5 mph, all of our products service areas that conventional wind turbines cannot. Conventional turbines have a peak efficiency that starts at 20 mph. *Conventional turbines are either on or off which means a turbine is producing either 100% power or 0% power.* American Wind's Micro turbines are efficient producing power throughout its entire range.

The ability to cut in at 1.5 mph and exceed 140 mph wind speeds provides a resilient and secure power supply any where in the world day or night.

*Cut in Speed: 1.5 mph | 0.67 m/s
Max Speed: 140 mph | 65.58 m/s*

**m/s - Meter per second*

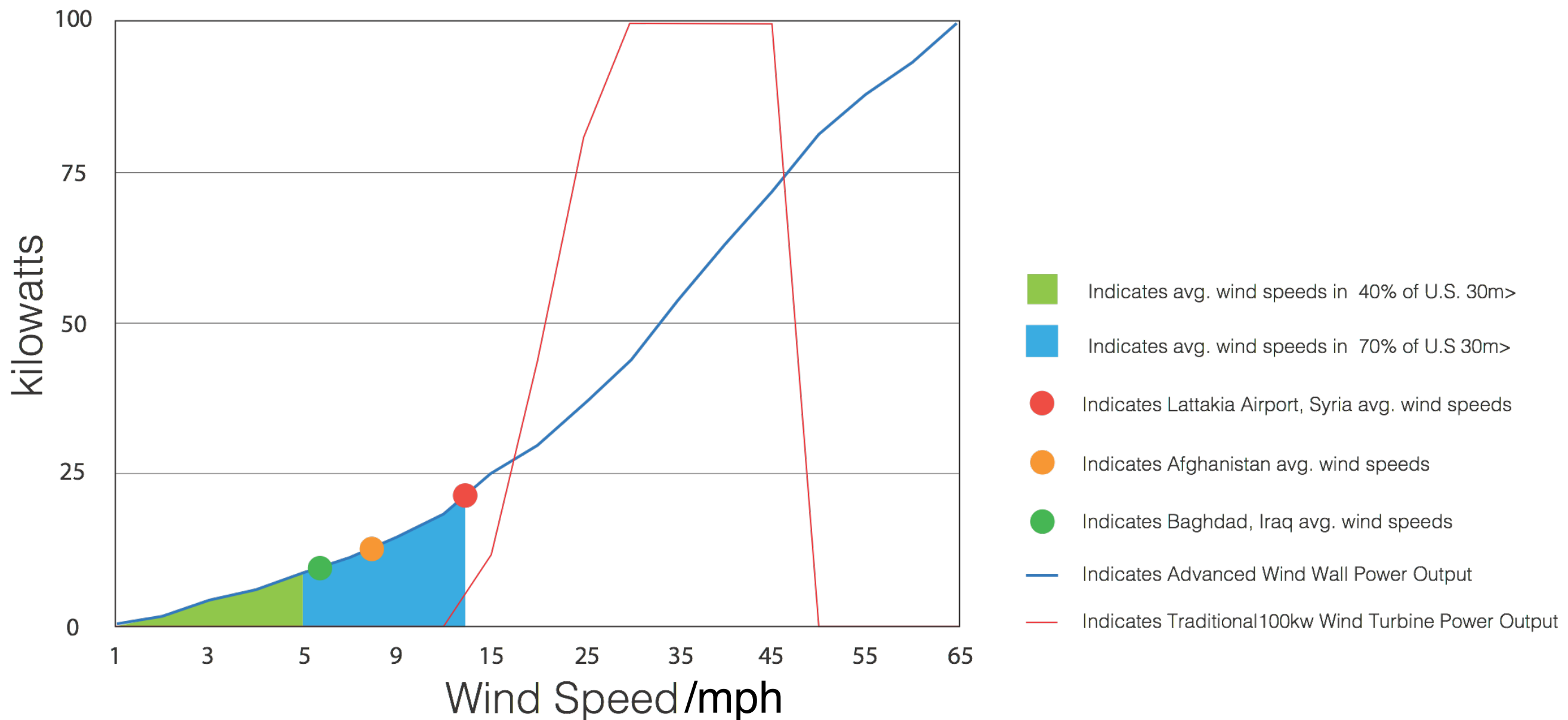
**mph - Miles per hour*



AMERICAN WIND ADVANTAGES

WIND SPEED

At Home or Abroad: Going where others cannot go; producing where others cannot produce.



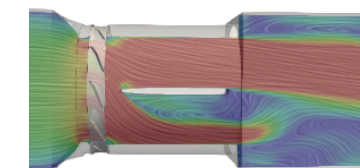
AMERICAN WIND ADVANTAGES

PERFORMANCE TESTING

Proven Technology - wind tunnel and simulation confirmed.

“It is important to note that regardless of the level of measurement accuracy and controllability, test data for a common test article will show some level of variation in performance when measured at different facilities. This is due to a variety of possible differences including measurement methods and instrumentation accuracy, facility operations, and the inherent limitations of how well a wind tunnel simulates “real-world” conditions. However, even with these possible effects impacting the test data, the revised JT results indicate improved agreement with GTRI data, which provides experimental confirmation of the performance of AWI’s micro wind turbine designs”

-Jacobs Summary Statement

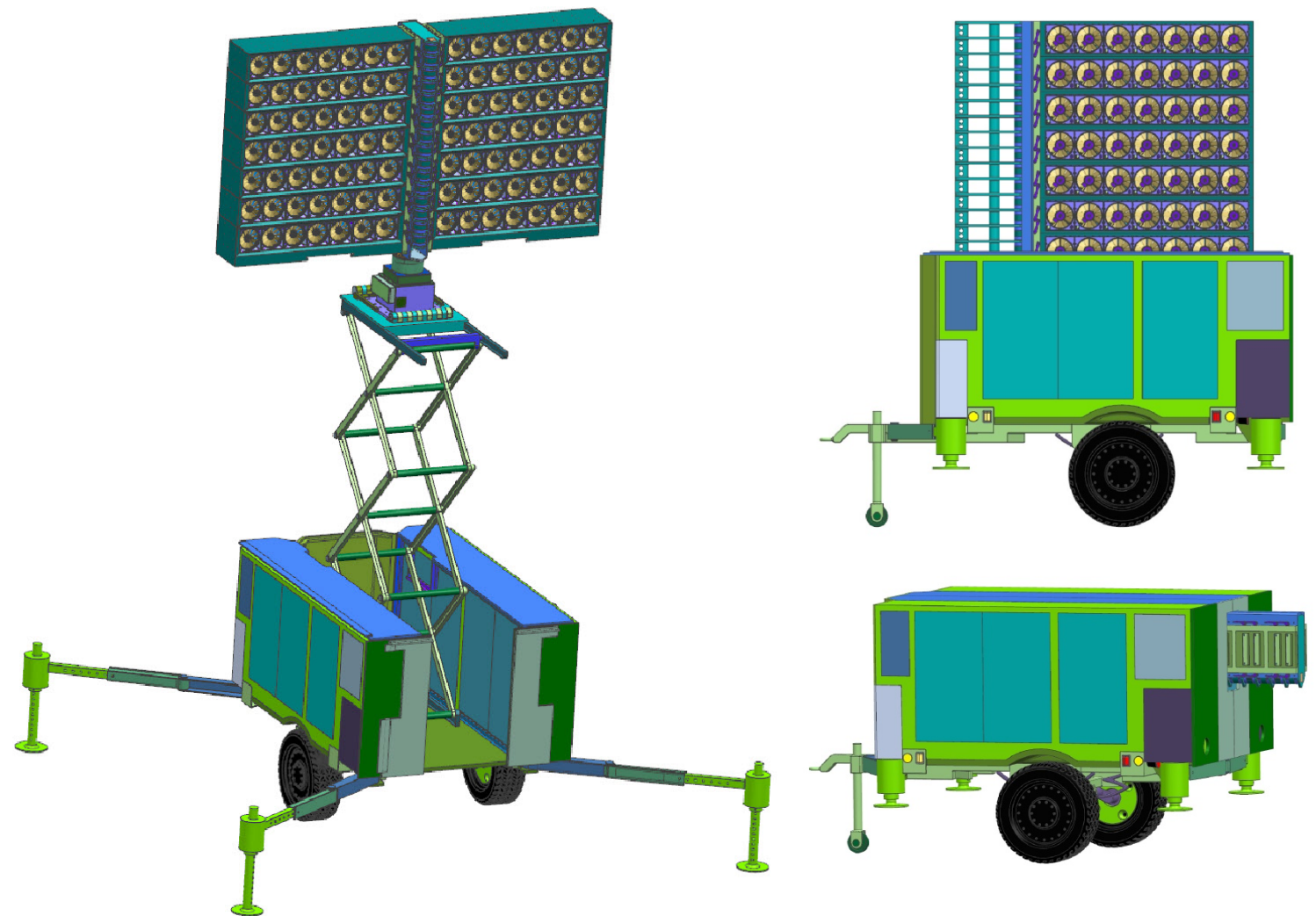


AMERICAN WIND ADVANTAGES

PORTABLE ENERGY POWER SOURCE (PEPS)

At Home or Abroad, providing consistent, storable energy in a flexible deployable manner.

From installation use to emergency response to forward operating base, the MicroCube™ is converted to an Expeditionary Portable Power Unit in the form of a Portable Energy Power Source (PEPS). PEPS is a trailer system with a one hundred (100) kilowatt hour (kWh) battery system, ninety-eight (98) kilowatt (kW) wind turbine system, multi-system charging ports including: dual generator ports, shore power conditioner and solar panel inputs. While maintaining a small portable footprint, the PEPS' built-in wind turbine system will allow extended operation time without the need of fuel based support or logistical support thus improving resiliency and installation security on all levels.



AMERICAN WIND ADVANTAGES

MAINTENANCE

If size, wind speed, and flexible configuration aren't impressive enough....

- The MicroCube™ is made of AT²LAS a wind proof composite that is warrantied for 30 years and is bullet and electromagnetic pulse resistant.
- The generator of the MicroCube™ is designed to install like a printer cartridge...one way in, one way out.
- The American WindWall™, Advanced Wall™ and PEPS keep operating during replacement of a unit.
- Five year full replacement for the generator and 30 year life span on the system.

AMERICAN WIND ADVANTAGES

TRAINING

If size, wind speed, and flexible configuration and maintenance aren't impressive enough....

- Used at Home or Abroad, training time is 1 hour or less. The person who uses an American Wind product at home will need little or no additional training to use abroad.

- The WindWall™ can be set up by two persons within 8 hours. The Advanced WindWall™ can be set up by two persons within 48 hours. The PEPs can be set up by 2 persons within 2 hours.

AMERICAN WIND ADVANTAGES

MONITORING AND CONTROL

If size, wind speed, and flexible configuration, maintenance and training aren't impressive enough....

- Specially developed monitoring and control will permit dashboard visibility of power production wherever the MicroCube™ is in operation.
- Advanced diagnostics identifies the performance of individual MicroCube™ power generation unit and provides immediate repair knowledge on failures minimizing downtime of any one unit with simple plug and play convenience.

QUESTIONS?

How much power
do you need?

From MicroCube™
to WindWall™ ...

We can do it all

www.americanwindinc.com

866-844-8686



dan.yost@americanwindinc.com

