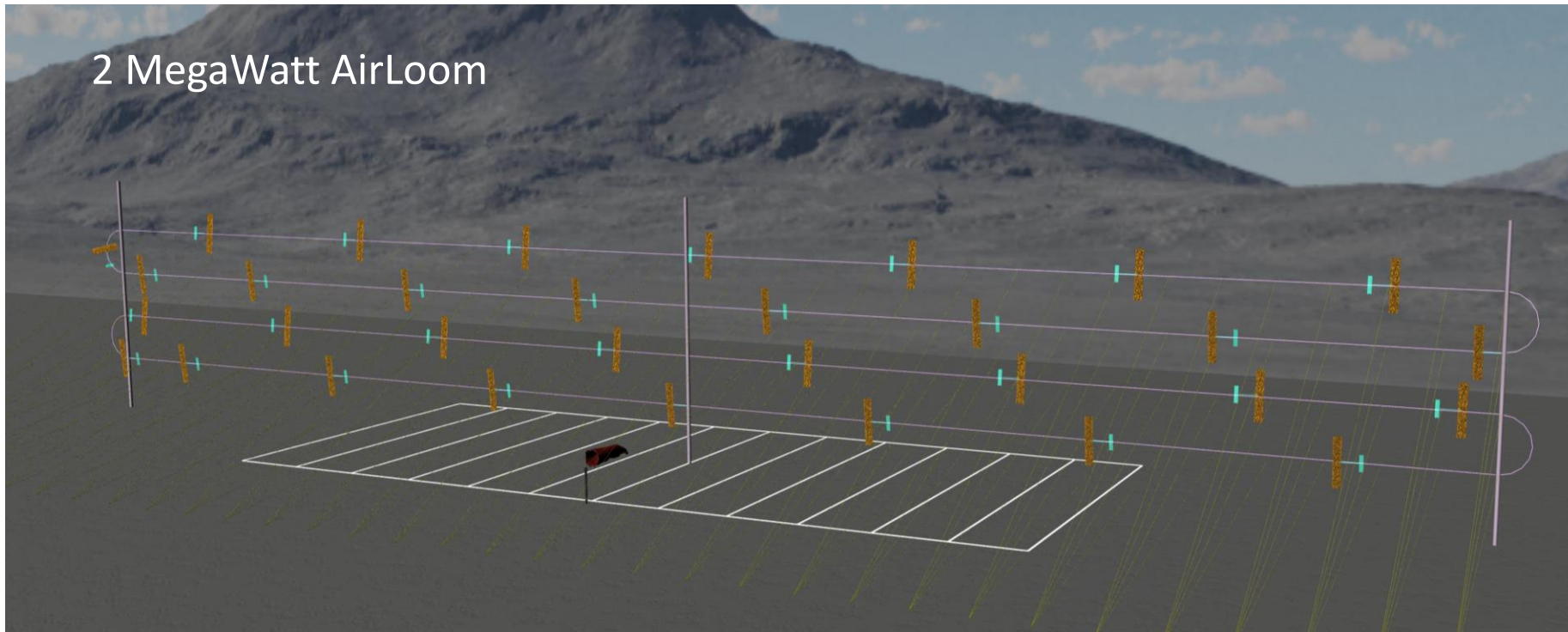


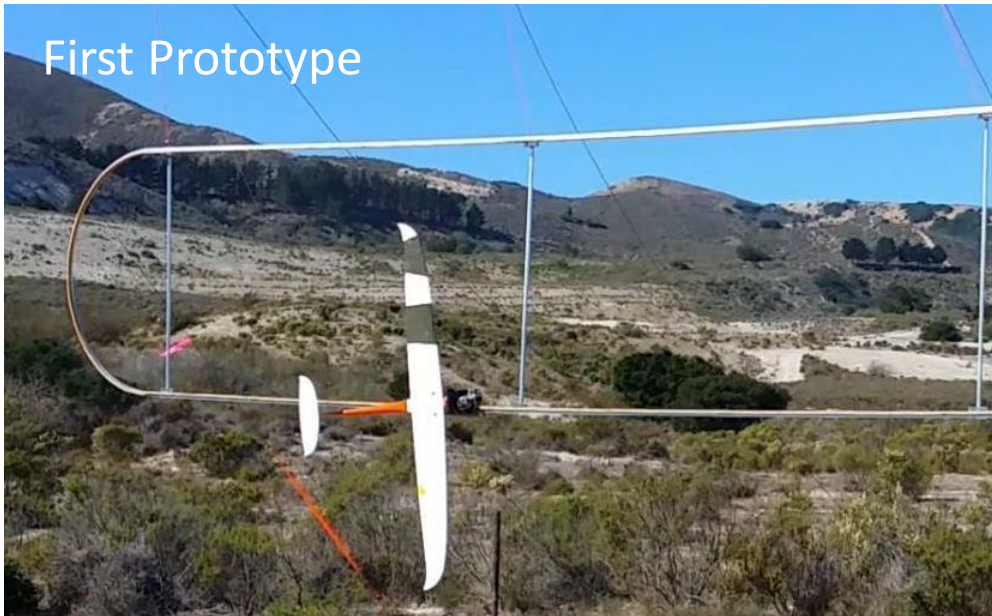
2 MegaWatt AirLoom



Wind Turbine



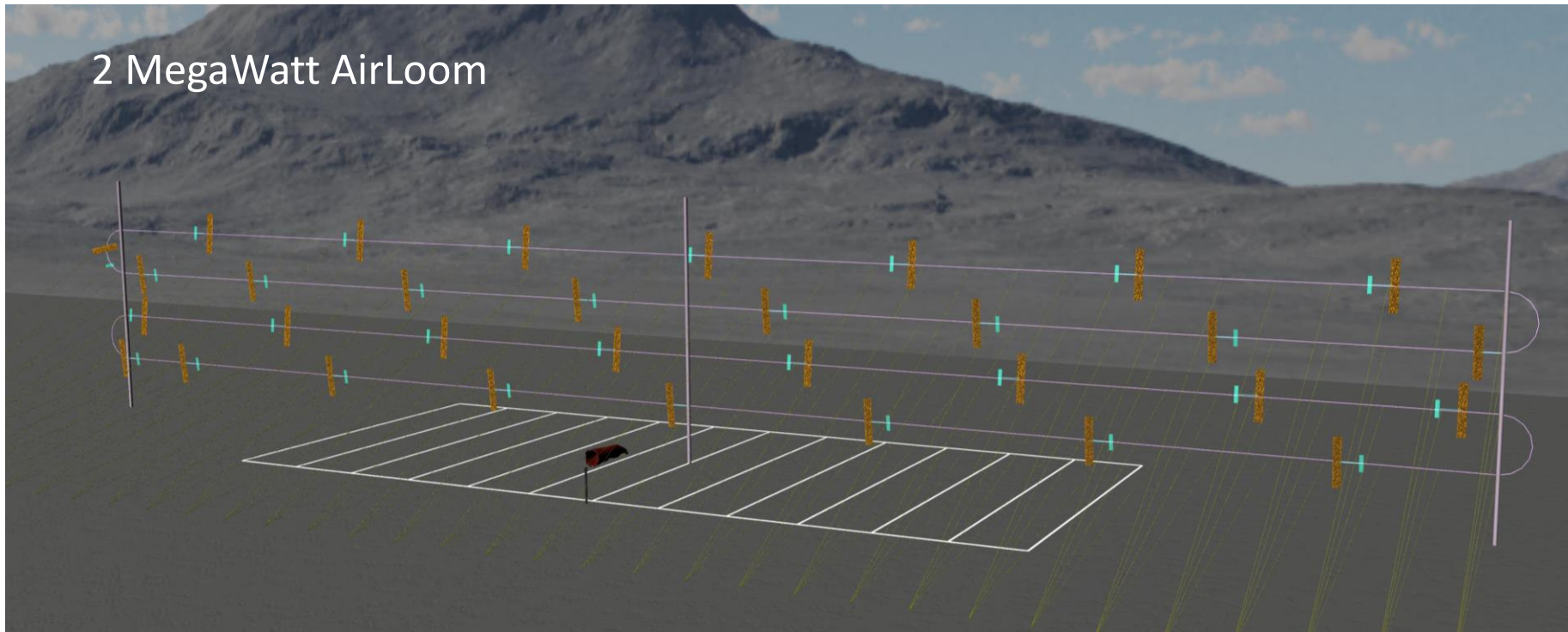
First Prototype



## AirLoom

Compared to the 3 blades of a wind turbine, the AirLoom runs multiples small airframes on a slender oval track, with downwind forces supported by bridles. Eliminating mass (23x) yields a 15x capital cost advantage.

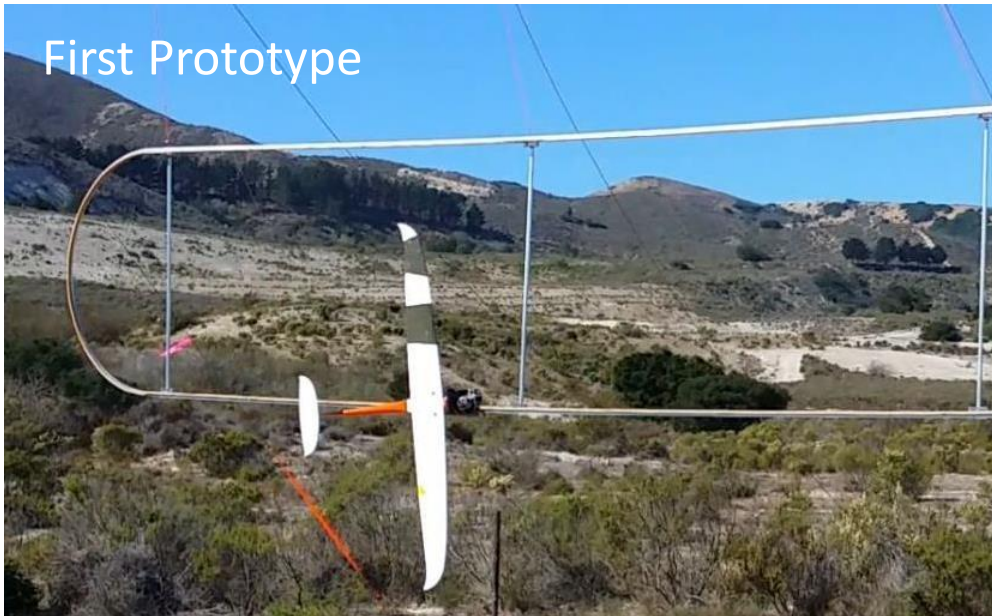
2 MegaWatt AirLoom



Wind Turbine



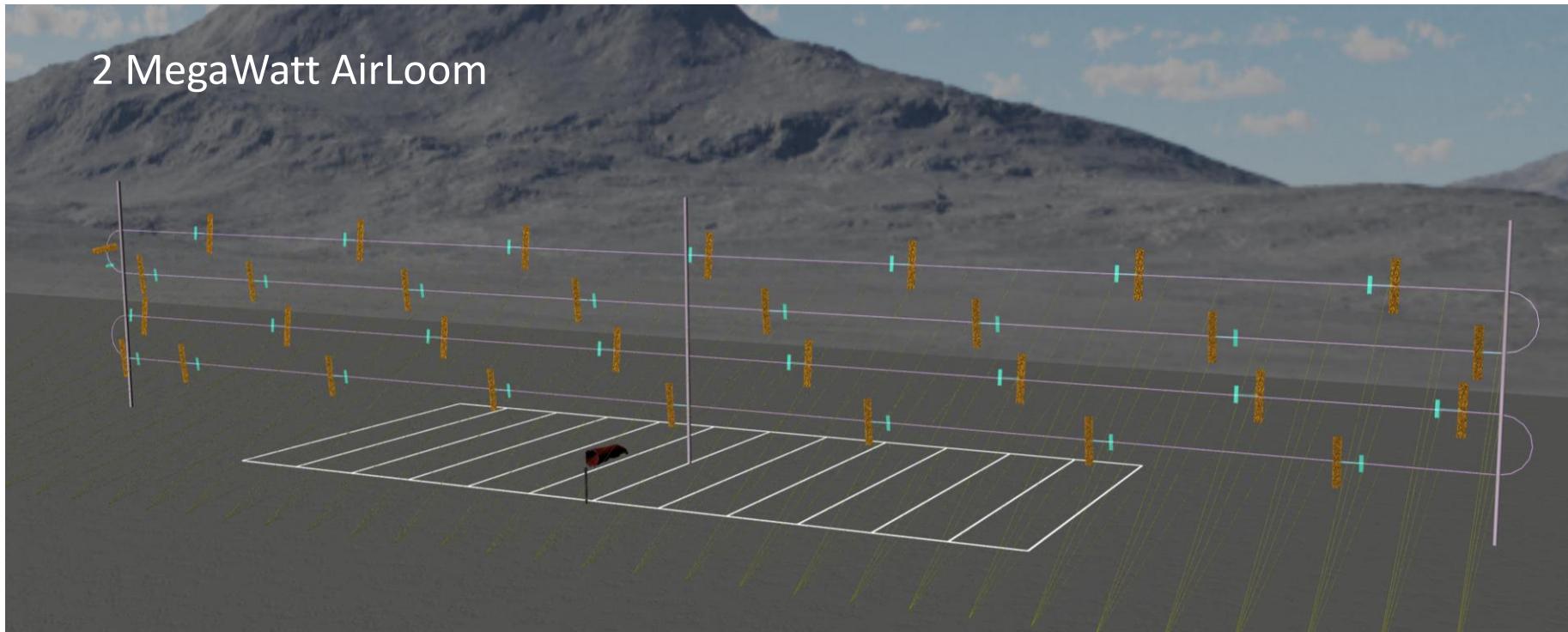
First Prototype



### Physical Benefits of the AirLoom Compared to Traditional Wind Turbine

- |  |   |
|--|---|
| 1. Short Lever Arms                        | 3. Generator Magnets Move 20x Faster – More Efficient |
| 2. Forces Held By Tension, not Compression | 4. Mass Production Through Simple Processes           |

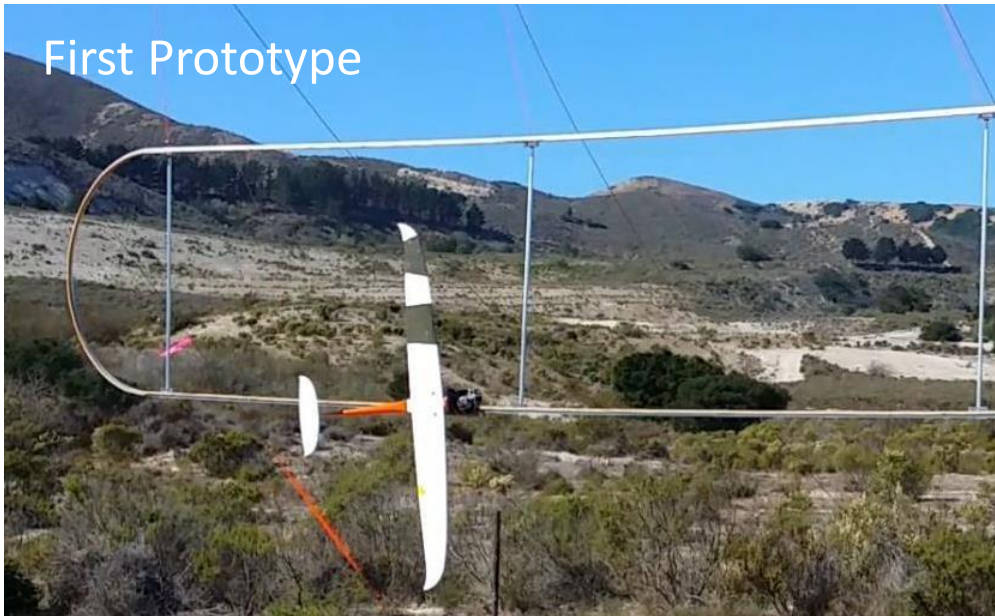
2 MegaWatt AirLoom



Wind Turbine



First Prototype



### Operational Benefits

23x Less Material  
15x Cheaper

Easy To Transport  
(20 ft wings not 180 ft  
Blades)

Completely Modular and  
Scalable (100kW to GW)

Can be Low and Long for  
Zoning Issues

Easy to Manufacture

Can be Tall for Stronger  
Winds

## Partners



National Science Foundation  
July, 2016  
\$225k Phase I SBIR Grant



Engineering Analysis Software  
Incubator Program



University of Wyoming

- Wind Energy Research Center
  - Incubator Tenant

## Team

Robert Lumley, Founder  
BA, Williams College  
MBA, UCLA

Three Engineers (BS, MS, PhD)  
One Programmer

## Collaborators

Dr. Doug Hunsaker  
Utah State University  
Aerodynamics

Dr. Subhashish Bhattacharya  
North Carolina State University  
Power Electronics

# AirLoom Energy – Potential Impact

## WindFarm vs AirLoom costs for 100 MW Windfarm

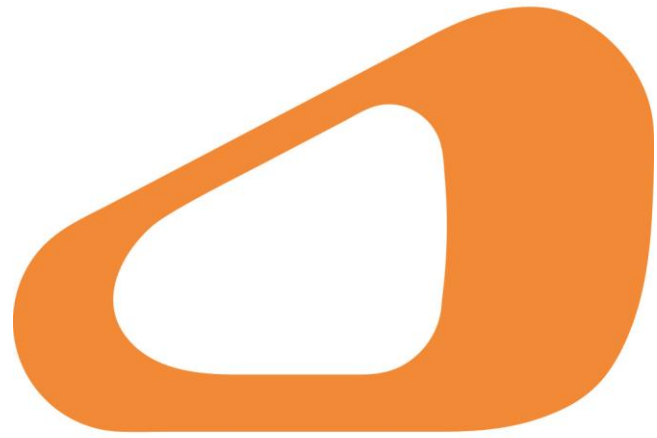
	HAWT	AirLoom	AirLoom Advantage	Why
Turbine Cost	\$100 MM	\$6.7 MM	15x	
Transportation	\$10 MM	\$0.1 MM	100x	
Installation	\$10 MM	\$1 MM	10x	Less weight, less mass up high
Roads/Foundations	\$22 MM	\$3.4 MM	6x	Less weight, short trucks
Electrical Supply/Installation	\$8 MM	\$8 MM	1x	Rails are conductors. Electronics embedded in rails.
Project Overhead	\$10 MM	\$5 MM	2x	Less cost = less overhead.
<b>Total Development Cost</b>	<b>\$160 MM</b>	<b>\$24 MM</b>	<b>6.7x</b>	

## LCOE (1 MW turbines installed in large wind farm)

Annual O&M	\$40k	\$18k	2.1x	Lower initial cost = lower maintenance cost. Maintenance done at ground level
Capacity factor	38%	35%	0.9x	Learning curve
LCOE	5 cents per kWh	1.1 cents per kWh	4.5x	Everything cheaper

## Patent Portfolio

- Four US Patents Issued
- Broad IP Protection
  - IP Adviser -- Morrison and Foerster
- International Patent Process Underway
  - AirLoom is a Registered Trademark



AirLoom

## Investment Opportunity

### Short Term

AirLoom Seeks Gated, Matching Funds with National Science Foundation (NSF)

- Phase I is \$225k (awarded July 1, 2016)
- Phase II is \$750k (July 1, 2017??)
  - Potentially eligible for NSF matching

### Long Term

Wind Farm Development Capital, with IRR's of up to 60%



*The (AirLoom) proposal includes a plausible first order estimate of the minimum forces and structures required for energy generation with this topology. NSF Reviewer, March 2016*

*In the \$3 trillion a year energy market, for someone who really is cheaper, the rewards will be quite fantastic. Bill Gates, February 22, 2016*



Thank You

Robert Lumley

President

AirLoom Energy

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