



Sandia
National
Laboratories

ENERGY &
HOMELAND
SECURITY

AERO-MINES (MOTIONLESS, INTEGRATED, EXTRACTION) FOR SAFE, DISTRIBUTED, SCALABLE WIND POWER

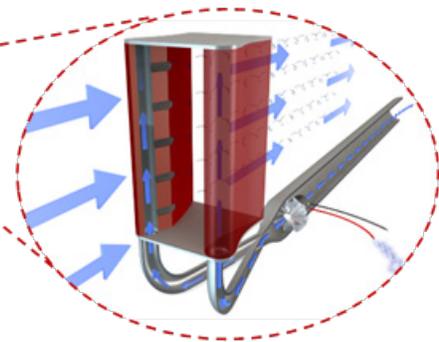
A reliable, distributed, scalable system for wind energy extraction in both building-integrated and stand-alone configurations

Innovative, low-cost wind energy extraction

Aero-MINE (Motionless, INtegrated, EXtraction) patent-protected wind energy harvesters offer safe, scalable, distributed electricity generation with no external moving parts. Aero-MINEs easily integrate with existing buildings or function standing alone. When wind blows over the Aero-MINEs it creates a low-pressure region between the airfoil-pairs that make up

the body. The low-pressure region sucks air out of air-jets in the surfaces of the airfoils. This air is pulled from ducts in the interior of the airfoils, through a manifold and over a turbine and generator, producing electricity. The turbine and generator are located inside for easy access and away from climate extremes.

Integrated into rooftops and built environments, Aero-MINEs sweep much more area than micro-wind turbines and thus can extract much more energy from the wind. They have no external moving parts, making them safe and reliable. They are much less costly to manufacture than solar photovoltaics (PV), produce day and night, and are economically superior at average annual wind speeds across much of the U.S. Where distributed PV has already been installed, Aero-MINEs provide a complementary power source that functions when PV cannot, reducing the need for battery storage and leveraging the existing electrical infrastructure in the building.



Artist rendering of an array of 54 pairs of Aero-MINEs integrated onto a data center (Google Earth image) with a close-up depicting the operation of an airfoil-pair (credit Vicente Garcia).



The initial target markets include commercial warehouses, data centers and large retailers that are heavy electricity consumers. The largest companies in these markets are committed to long-term goals of relying on between 30% and 100% renewably-generated electricity. Because Aero-MINEs are scalable, safe, and passive, they are also attractive for individual consumer markets including apartments and communities.

Overall Benefits

- Lower Costs
- Greater Reliability
- Increased Safety
- Environmental Benefits
- Consumer Appeal
- Energy Security

Commercialization Path

Sandia is looking for commercialization partners to:

- Fund the final computational and wind tunnel optimization
- Deploy and demonstrate pilot-scale Aero-MINEs
- Invest in a spin-off company to go to market

Aero-MINEs provides a safe, quiet, scalable design for distributed wind power with no external motion.

Contact:

Dr. Brent Houchens
bchouch@sandia.gov
(925) 294-6703

