

High Wind Speed Performance of AeroMINE at Pilot-Scale

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Motivation

Distributed, point-of-use rooftop wind energy has not been successful, unlike rooftop solar.

Past solutions have suffered from:

- poor power performance
- poor resiliency

There are untapped markets for renewable rooftop and remote, harsh climate wind energy

Novel AeroMINE Concept



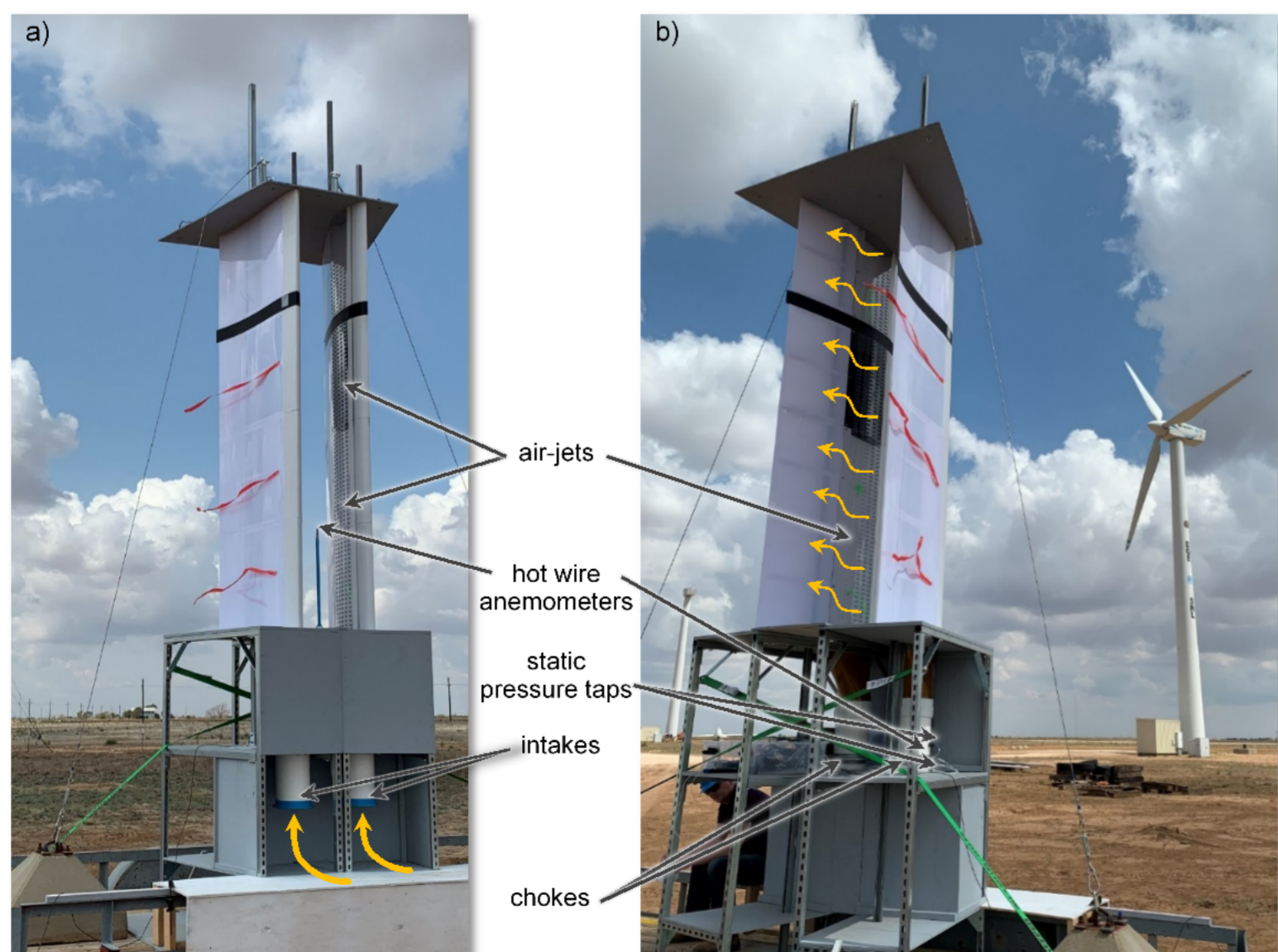
Early AeroMINE concepts on large format buildings

Large swept area → large power

No external moving parts → reliable, safe, quiet

Integrates with rooftop solar → complementary

Field Test



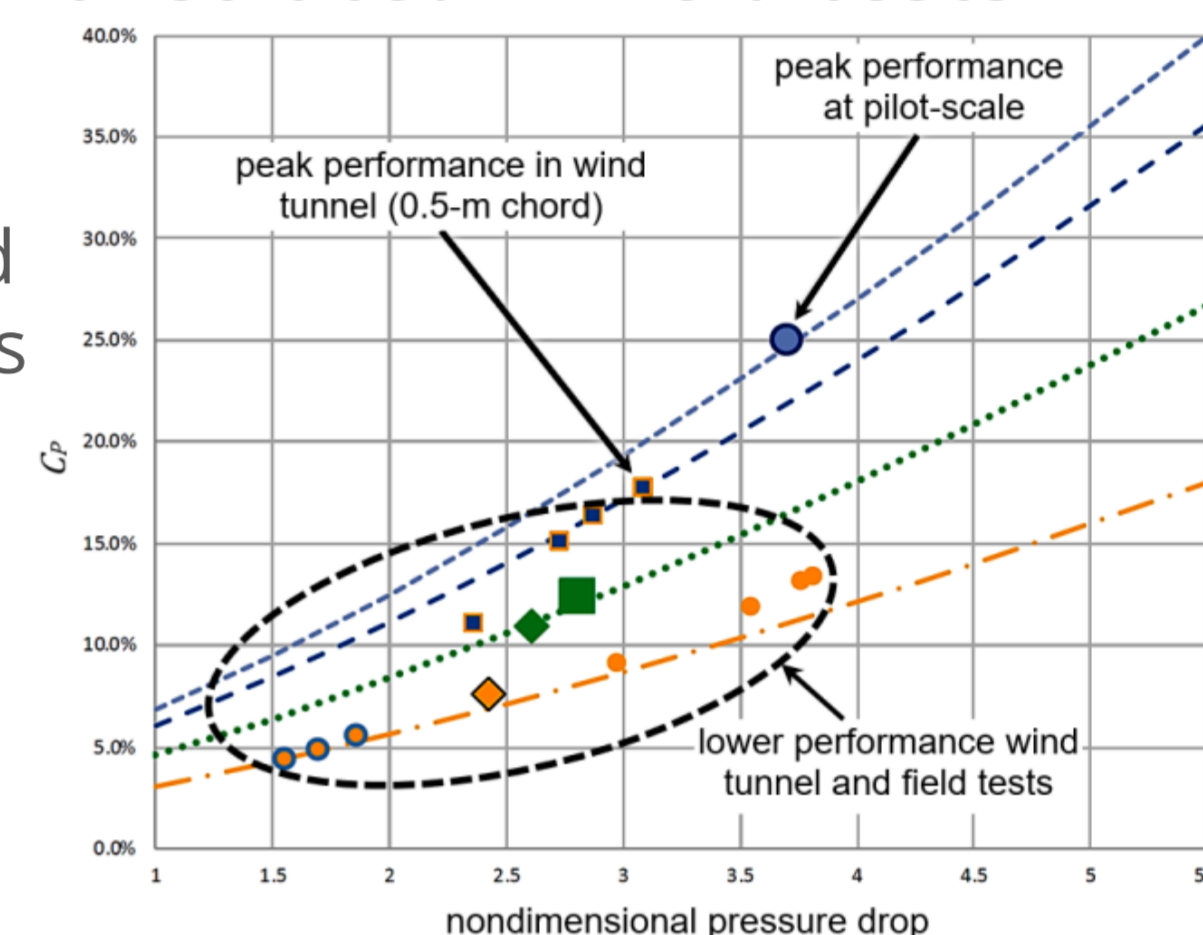
Pilot-scale (3-m tall, 1-m chord) AeroMINE test at SWiFT shown from a) the front and b) behind

Results

Good performance demonstrated in field tests

- 25% peak performance achieved (42% of Betz) in pilot-scale tests based on choke measurements

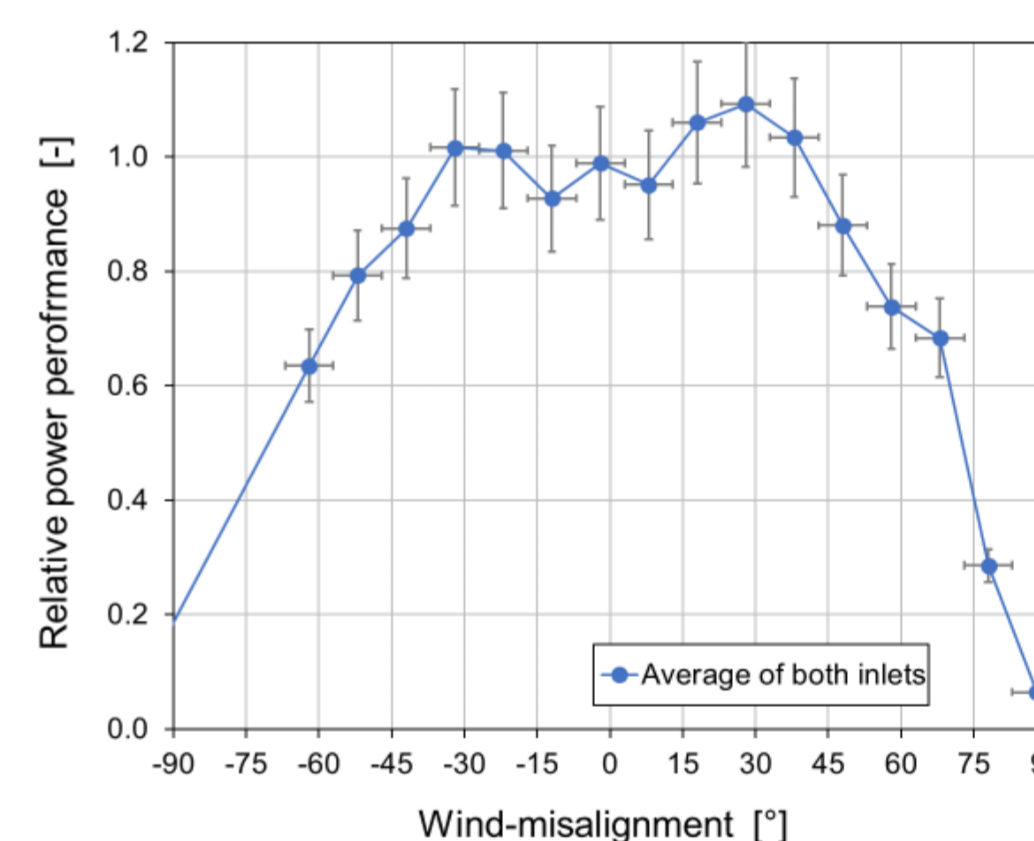
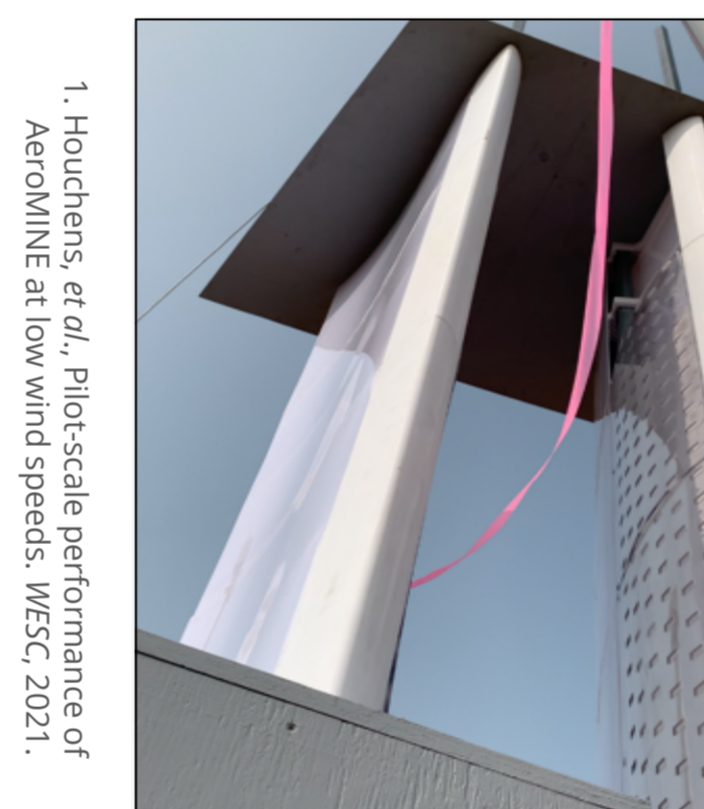
$$C_p = \frac{\Delta P_{choke} A_{duct} u_{duct}}{0.5 \rho A_{exit} U_{\infty}^3}$$



25% aero-mechanical efficiency achieved for high wind speed pilot-scale tests

Previous low wind speed off-axis tests¹

- excellent performance up to 30° misalignment in low wind



Performance in off-axis, low-speed (~5 m/s) wind

Commercialization Efforts

First Aeromine delivered, installed and making power in March 2022*

*Aeromine Technologies, Inc. proprietary, used with permission



Acknowledgements

Development and testing of AeroMINE prototypes was supported by Sandia Laboratory Directed Research and Development funds.

Special thanks to the team at SWiFT for logistics and technical support during two field test campaigns.



Sandia National Laboratories is a multission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.
SAND2022-XXXX

AeroMINE
(Motionless, INtegrated Energy)



1-3 June 2022, Delft, NL