

Is Wind Energy Industry ready for disruptive solutions?



Martins Ummers
Winterwind, February 4-6 year 2019

TRIALS OF DEICING AND ANTI-ICING



Picture by Wicetec (<https://wicetec.com/technology/>)

WTG SERVICES UP TO KNOW

- To deice or clean: **At least \$5-20k. At least 24h downtime.**
- To apply coatings: **At least \$30-50k. At least 48h downtime.**



HAVE WE SAFE AND AFFORDABLE WAY?



AERONES INTRODUCTION VIDEO



HEAVY-LIFT DRONE



- Max lifting capacity 200kg;
- Operational capacity 150kg;
- Tethered, powered by cable from generator- endless operation time;
- Water is pumped from the base. One time amount 1T.

WTG BLADES MAINTENANCE DRONE



AERONES WTG DRONE'S VIDEO



OUR SOLUTION

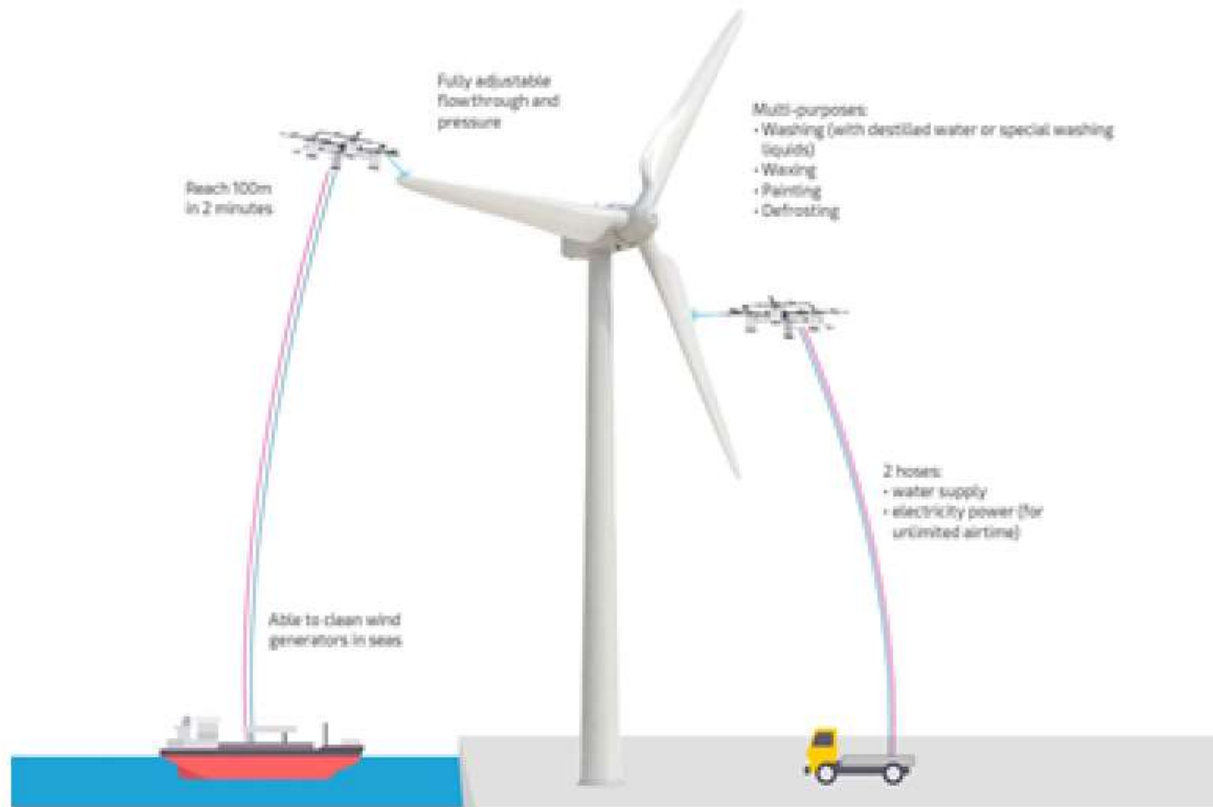
Tethered heavy-lift drone

- 20x faster (1-4h)
- 5x cheaper
- Blade inspection included
- Applies additional protective coatings
- Safe (no humans or helicopters)



<https://youtu.be/mP5LZYpFggM>

ONSHORE & OFFSHORE OPERATIONS



WHAT WE PERFORM

Deicing

Ice on blades forces turbine downtime.

- Up to 20% revenue loss in Canada, Northern US&EU
- Before Aeronos Deicing was difficult and not safe task - done with helicopters or expensive heating systems
- Aeronos reduces risk, is a lot faster & inexpensive

Cleaning/ Washing

Bugs and dirt on the blades reduces blade efficiency and causes erosion of the blades

- In South of Spain, Texas, India, Mexico - bug problem & dust
- Should be cleaned up to 4x a year
- North EU, USA, CA - needs to be cleaned before applying hydrophobic coatings

Applying coatings

Increases efficiency & extend wind turbine life

- ICE Adhesion Reduction Factor - 60
- Reduces bug/dirt accumulation
- Increase the lifespan of a wind turbine blade by 20-30%
- Needs to be reapplied every year

APPLY OF COATINGS

Increases efficiency and extend wind turbine life

- ICE Adhesion Reduction Factor - 60%
- Reduces bug/dirt accumulation
- Increase the lifespan of a wind turbine blade by 20-30%



THANK YOU

AERONES

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