Breaking new ground

Aerones robot applying NEINICE uptower during blade maintenance

In a conversation with Aaron Dupuis, Director of Marketing at Phazebreak Coatings, we delve into the innovative solutions the company is offering to revolutionize renewable energy. With a focus on both cold and warm climate challenges, Phazebreak's products are not only enhancing the performance of wind turbines in icy conditions but also venturing into the solar market with groundbreaking coatings. Here's a glimpse into their journey and the impact they aim to make on the renewable energy landscape.

PES: It's good to speak with you Aaron. Phazebreak Coatings has been a recognized name in the industry for five years now. How's business been recently?

Aaron Dupuis: Given that this year has brought intense winter conditions around the world, we have been incredibly busy organizing the upcoming spring and summer icephobic coating application season. We expect this year's turbine application numbers to be some of our highest yet.

At the same time, we are entering the solar market for the first time in our five years as a company and rolling out a brand new product, Surface Slip. This is a self-cleaning and hydrophobic coating based on the NEINICE formula.

PES: Your goal is to revolutionize wind energy by keeping it safe, reliable, and profitable through the worst of winter storms. How can your products and solutions make that happen?

AD: Our flagship product, NEINICE, is designed to mitigate the formation of ice on wind turbine blades. Ice can significantly reduce a turbines ability to produce power, and in the worst cases can even cause damage to the blade. The idea behind it is simple: to help operators in colder climates keep their blades spinning and avoid costly downtime and the need for ice removal.

Though the coating can't prevent all ice build-up, our in field studies show that coated turbines consistently out-perform their uncoated counterparts during icing events. In some cases, we see the coated turbines keep turning throughout entire storms, and that is obviously the best case scenario.

However, in climates with severe wind and ice, our hope, and our data supports this, is that NEINICE can keep the blades spinning for a few more hours at the beginning of an ice event and return to optimal performance a few hours earlier. Those few extra hours can mean a huge increase in power production and revenue coming from a wind farm that might otherwise suffer huge losses.

PES: Global warming is impacting weather patterns and the severity of such winter storms, even as we move towards net zero to try to mitigate its effects. How can your products be adapted to help mitigate such conditions?

AD: Our products are developed with these very questions in mind. When we first entered the wind energy sector, it was to solve a pain point that we had identified in the industry: how can we continue striving towards net zero energy through wind if that energy solution doesn't prove reliable in the winter?

As you said, winter conditions are getting more intense as climate change continues to evolve, so it is time to introduce bold new solutions. We believe that NEINICE is just such a solution that can make wind energy a year-round winner for consumers and operators even in environments that experience icy winters.

PES: When you last featured in PES the focus was on the NEINICE icephobic coating. You touched on the lifecycle of the product then, but as studies have continued is there now new data available?

AD: Yes. Working with our customers we were able to look at data from previously coated turbines on two wind farms over a 3 year period. The data set they provided showed the percentage increase in the power output of coated turbines compared to uncoated turbines on each farm over a three year period. We were then able to track how the coated turbines performed during icing events each consecutive season.

PES: Talk us through these latest findings and what this means for the viability of the coating.

AD: At wind farm #1 the percentage increase was 25% for year 1, 15% for year 2 and 10% for year 3, with the assumption that year 4

Aaron Dupuis

A nacelle surface without NEINICE coating covered in a thick layer of ice
These photos were taken on the same day

A blade from the same turbine which is free of ice build-up

would be at 0%. At wind farm #2 the percentage increase was 40% for year 1, 29% for year 2 and 12% for year 3, with the assumption that year 4 would be at 0%. That customer is going to be doing a 4 year recoat program because the winter production more than pays for the maintenance program.

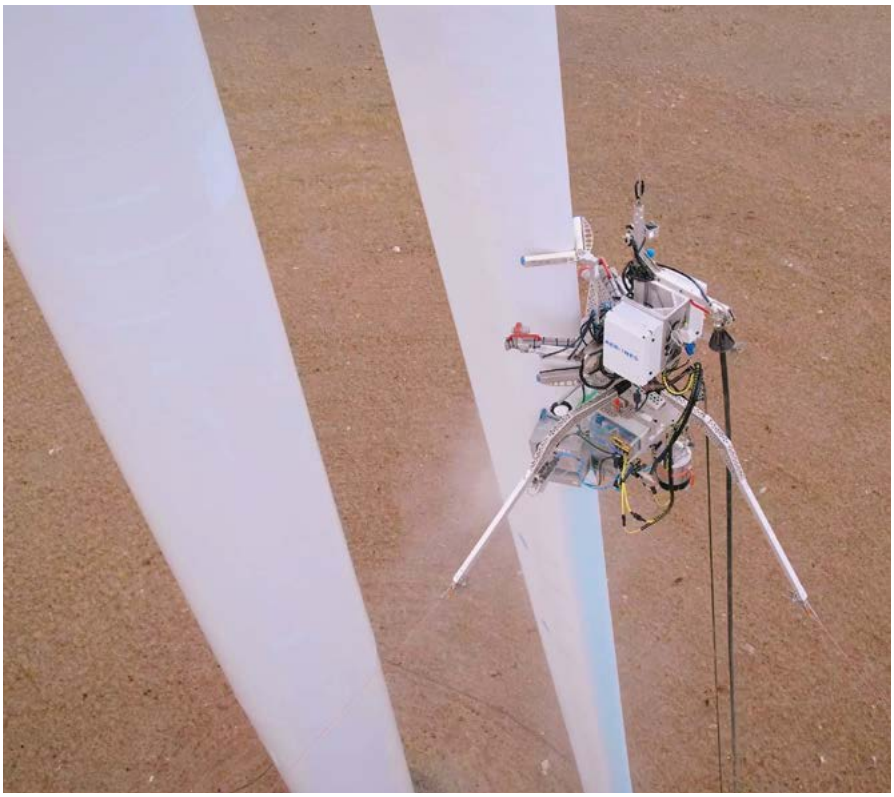
PES: Aside from the NEINICE icephobic coating, you are preparing to launch a new hydrophobic product for wind turbines in warmer climates, correct?

AD: Yes! That data set I mentioned also came with a bit of a surprise: during the warm weather months those same coated turbines showed a 5% to 10% production improvement over the uncoated turbines. We believe that is due to our product also being hydrophobic, self-cleaning and impact resistant. This data also reaffirmed our interest in our newest coating, Surface Slip, a water based rework of our NEINICE formulation.

PES: What type of conditions will this be appropriate for and what advantages will it offer?

AD: In warm weather climates where operators don't need icephobicity, Surface Slip can step in as a solution to prevent dirt, dust, and debris from affecting AEP. We think this could be especially useful for wind farms in South America, southern Europe, and Asian countries like India where they struggle with dust storms. The impact resistance is also retained which can prevent damage from bird strike and other airborne hazards.

PES: Can you explain how the coating will work and its proposed lifecycle?



An Aerones robot applying NEINICE uptower

AD: Like NEINICE it will be a clear durable coating and the expectation is a three year lifecycle depending on the intensity of weather conditions. It is designed to prevent the build-up of grime, insects, dust, etc. by providing the blades with a self cleaning, hydrophobic sheen.

While we are currently performing lab tests, our real goal is to begin pilot programs so we can track real world data over the next few years. This is the process we followed with NEINICE and it has served us well. We aim for the coating to provide all of the benefits of NEINICE is without the icephobicity.

PES: Has the product been tested and used in real-life scenarios yet?

AD: We have recently started a pilot program in India, and will hopefully be able to report more on that soon.

PES: What particular advantages do you envisage this solution having for wind turbines?

AD: Much like NEINICE, our goal for this coating is to help turbines perform efficiently in any environment. In this case, that means reducing the need for blade cleanings. By introducing the self-cleaning properties of Surface Slip, maintenance costs can be brought down and the drag which filth creates can be significantly reduced.

PES: With Phazebreak now catering for both cold and warm climates, what's next for your business in terms of expansion on a global scale?

AD: Our mission is to help the world generate renewable power in harsh environments and bring that power to your homes and businesses without disruption. Furthermore, Phazebreak's goal has always been to evolve from 'the icephobic coating for wind turbines company' into 'the renewable energy coating company'. As we expand into solar with NEINICE and Surface Slip we are keeping our eyes on the horizon and brainstorming new chemical solutions to the challenges facing clean energy operators.

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