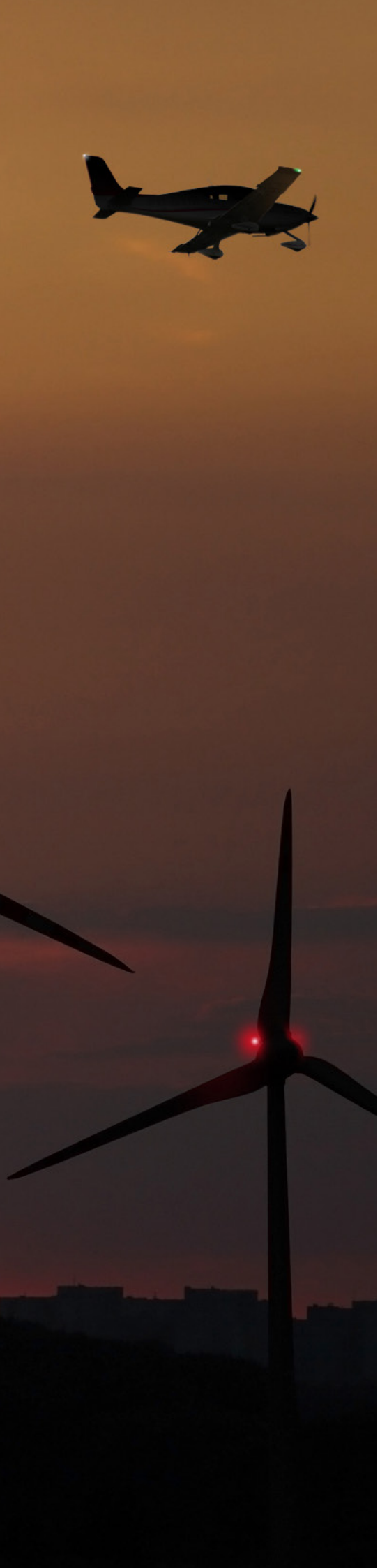

Tackling light pollution across borders: transponder-based ADLS goes international

Aircraft-detection lighting systems (ADLS) are among the most talked about innovations when it comes to increasing acceptance for wind energy. A transponder-based solution, which has already conquered the German market, is a promising tool across European borders as well as overseas. PES sat down with Henning von Barsewisch, CEO of Lanthan Safe Sky, to talk about his vision for a broad implementation of transponder-based ADLS worldwide, and the pragmatic and unified policy approach that is needed to provide a legislative foundation.

PES: It's lovely to welcome you to PES Wind and I'm looking forward to learning more about Lanthan Safe Sky. Would you like to introduce the company and tell us a little bit about what you do, to start us off?

Henning von Barsewisch: Lanthan Safe Sky is a joint venture that was founded in April 2020. Three companies, Lanthan, Air Avionics and RECASE started working together on transponder-based ADLS systems many years ago, with a mission to create safe, market-mature, cost-effective and sustainable ADLS products.

So, despite being a young and agile company, we are fortunate to have the expertise of a leader in aviation obstruction marking technology, an aerospace approved manufacturer of avionic instruments and an experienced engineering and consultancy service provider in the field of renewable energy at our disposal.

Starting out with a team of 12 experts, LSS has grown to include more than 40 employees, and we continue to expand.

PES: Can you tell us a little bit about the technology you offer and how it has been received so far?

HB: Our ADLS locates air traffic based on transmitted signals sent out by transponders in aircraft. Thus, we can switch off the red obstruction lights at wind turbine generators (WTGs) when they are not needed, as is the case when there are no aircraft in a defined zone around the WTG.

Despite the over-fulfilment of all safety requirements, we are able to reach an average beaconing-off time of 98%, and in many cases close to 100%.

The technology has been extraordinarily well received, due to the unique circumstances of the German market. In 2020, it became mandatory to install ADLS for both existing as well as newly-built WTGs. This means operators are legally required to deploy an ADLS, whether radar or transponder-based. After a final extension in law, all need to be installed and running by the end of 2023. This legislative change was an important milestone for our technology, and we hope that other countries will follow.

PES: As a German-based company, what has your experience been like in this market so far?

HB: The year 2020, our founding year, was a memorable one for all of us due to the special circumstances during the pandemic. We turned the challenge of not being able to meet into a virtue and built an excellent team from all the corners of the country. We managed to grow and gain more customers than even our most optimistic projections would have predicted.

As the first certified provider of a transponder-based ADLS solution in Germany, LSS has become the market leader within a short period of time. This role comes with challenges in terms of adapting our internal structures and processes to be able to respond to the great demand.

Additionally, we are still in the midst of an international supply chain crisis that has affected pretty much every business sector. The last few months especially have been challenging, but we are definitely seeing a light at the end of the tunnel.

PES: What are the specific characteristics of the transponder technology that differentiates it from a radar-based system?

HB: Aside from the fact that it is free from emissions and does not require frequency assignments, the most significant advantage is that it safely detects aircraft flying very low.

While radar-based systems are faced with limited coverage close to the ground, due to reflections from buildings, vegetation, and terrain, the transponder-based technology uses signals which are sent out by transponders in all aircrafts flying at night and can be received even if being reflected or shielded. And then there's the cost advantage: a transponder ADLS costs roughly 10% of a radar solution.

PES: Is this solution suitable just for individual turbines or can it be applied to larger sites too? What services do you offer?

HB: We offer solutions for any application, single turbine, large sites as well as offshore projects. This involves site-specific engineering to ensure we can detect aircraft even at ground level, identifying possible modifications of the WTG lighting system, preparing documentation for the approval process with the relevant authorities, installing the equipment, demonstrating performance and finally sending the signal to safely turn off the lights when there is no aircraft around.

Our customers have access to their system via our user-friendly online web portal for analysis and reports so that they are always fully informed.

PES: So you sell and maintain the system?

HB: In fact, we offer a lifetime service solution where we provide a signal to the customer, rather than just selling the hardware. It takes on-site hardware plus centralized software to convert transponder signals into safe signals for the WTG lighting to turn off.

PES: What equipment do you install on the WTG and how complex is that?

HB: We mount a single receiver unit called ATS-3 for a given zone to pick up transponder signals and send them to our central server. In addition, we install an ATS-4 interface unit that distributes the signals generated by the server to the WTGs of the wind farm. The installation is very straightforward, and it only requires an internet connection.

PES: Do you have plans to expand into an international market in the future?

HB: The benefit of turning off the lights at night is obvious to many countries and we get a lot of interest from outside of Germany. In fact, we have already successfully completed a project in cooperation with Windpark Krammer, the first wind farm to use transponder-based ADLS in the Netherlands.

We are also in talks with operators in various other countries. After all, it is a conscious decision by policy makers to end our dependence on natural gas, oil and coal by promoting the obvious benefits of renewable energies and reducing bureaucratic hurdles.

PES: How do you see your technology setting a benchmark for the industry as a whole, in Germany and perhaps even on a global scale?

HB: For us, it's all about increasing acceptance for wind energy. We offer a solution to a very specific issue that was raised many years ago. The number of wind turbines will increase in the future, which means wind farms will get closer to populated areas.

Residents are often understandably sceptical of what that entails. So as an industry, we must do our part to come up with innovative solutions for the most pressing issues, light pollution being one of them. We are positive that our technology can contribute to the future of wind energy on a global scale.

The current geopolitical situation only reinforces the fact that renewable energy is not just the only way out of a worldwide climate emergency, but also the only means we have to become independent in our power supply. We need to take advantage of innovative technologies such as ours to improve the acceptance of renewables and to be able to confront sceptics with confidence while also taking reasonable concerns seriously.

PES: How do you see this technology developing going forward? Are there already improvements and new ideas in the pipeline?

HB: Right now, our main focus is on the installation process in Germany. We are confident that we will be able to ramp up the speed despite the global supply chain crisis in the next few months. In parallel, we are in talks with international operators from numerous European countries as well as overseas.

When it comes to possible fields of application, the sky is literally the limit: who knows, maybe in the not too distant future any tall building will be equipped with a transponder-based ADLS to minimize the impact of light pollution in big cities as well. We will definitely continue to think outside the box.

www.lanthan-safe-sky.com

Lanthan Safe Sky

Lanthan Safe Sky is the first accredited manufacturer of aircraft detection lighting systems (in short: ADLS) based on transponder signals. This technology allows for switching off the red obstruction lights at wind turbine generators (WTG) when there are no aircraft in close proximity to the WTG. Thus, light pollution is significantly reduced.