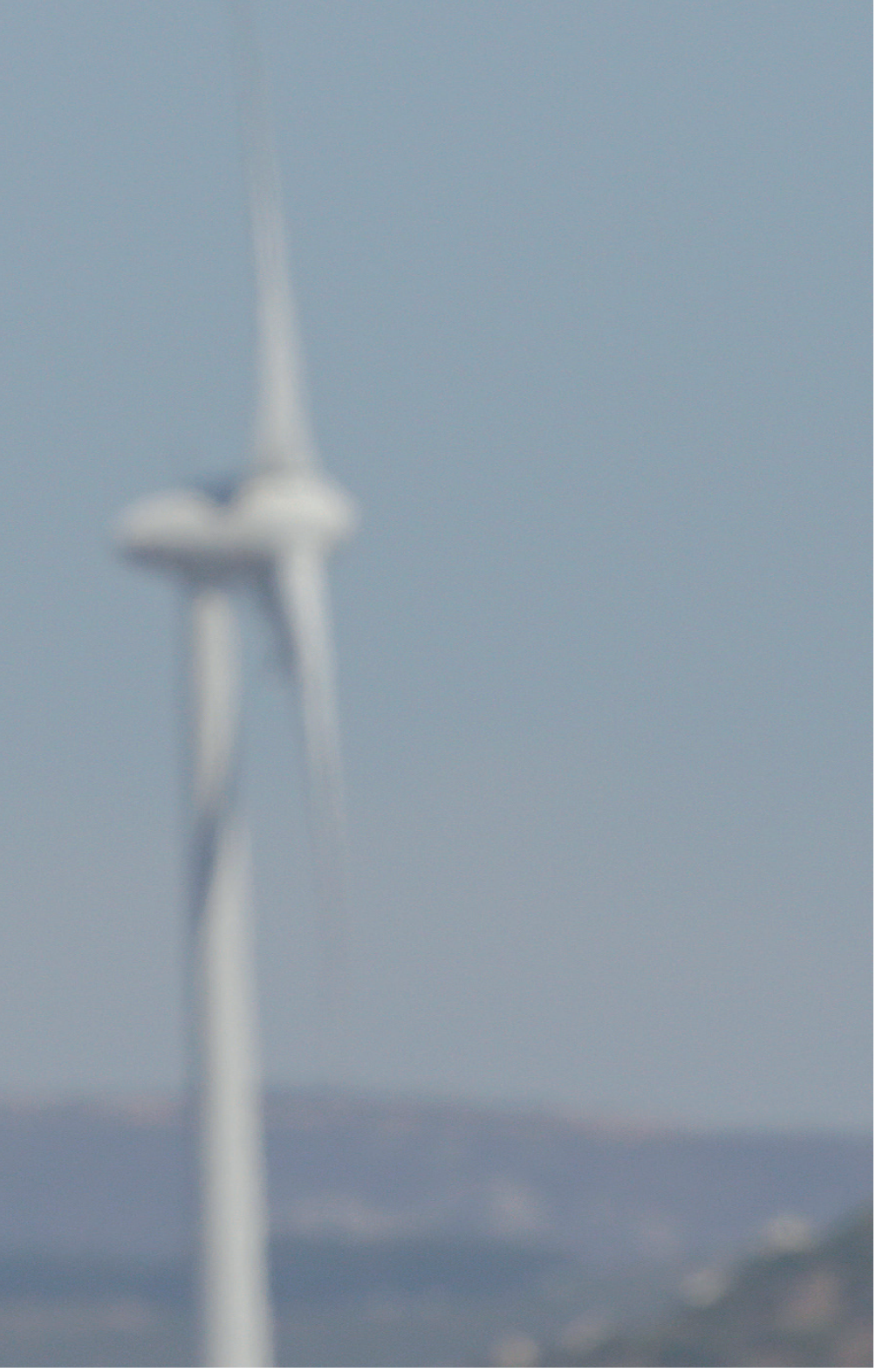
Saving birds and protecting investors

The death of even one endangered bird can be a great environmental loss

Rapid increase of onshore wind energy requires more and more land. Sometimes the new wind farms are located in bird sensitive areas. This is also true for some projects prepared for repowering. On the other hand, many wind farms face restrictions in operation due to bird mortality e.g. extended turbine shutdowns in migratory periods.

Wind energy is one of the most ecological energy sources. It is clean, renewable, has low operating costs, is space-efficient. But there are also cons. Fatal collisions between birds and wind turbine blades is one of the most important ones. Research based on field studies, video monitoring, or more recently tracking large birds using transmitters, contributes to social awareness and shows that the problem is serious, especially for endangered species.

This casts a shadow on the image of wind farms as a source of 100% green energy. The mortality of birds, especially threatened species, has an impact on the



‘The Bioseco system is based on the most modern achievements of human technology.’

conduct of this business. Regulatory offices are introducing new restrictions on the operation of turbines during the bird breeding season, during spring or the autumn migration. Therefore, turbines are stopped for a few, sometimes several weeks per year.

During those long stops birds can appear at wind farm, can fly towards the blades and ultimately may collide with them. Such stoppages are certainly ecological, saving the birds, but on the other hand, a stopped turbine does not produce electricity, which must be supplied to the grid from other alternative sources. Often this replacement energy comes from burning fossil fuels... and therefore is no longer green.

The times when birds pass nearby can usually be counted in minutes, sometimes in quarters of an hour per day, even minutes per day. This is how long the turbine should actually be stopped, the rest of the downtime is a pure waste of energy and money.

So how can we make sure the turbines only stop when absolutely necessary? How can we find out when the birds just fly by a given turbine? What’s the answer?

Those questions were at the root of the Bioseco solution. A solution so convenient that it is already used on wind farms in Germany, France, Poland and Spain.

The Bioseco system is based on the most modern achievements of human technology, but its operation is simple: it observes the space around the turbine and detects flocking birds. After detecting them, it monitors their flight trajectory, and then when the bird approaches the turbine, it activates a warning light and sound signals. Most birds change their flight direction, but if they keep flying, a signal is sent to the turbine to stop it.

The solution is very precise and effective. It uses latest technology, stereoscopy, AI, advanced algorithms and computing units. Installing the devices on the turbine takes less than one day and will work continuously for years giving access to data via an online platform as well as for remote monitoring purposes.

The system was evaluated in Germany within the NatForWINSENT research project funded by the German government and in Poland during a pilot run with the largest wind energy operator, PGE EO. This test proved that it is very efficient in detecting birds, and also has a very low false positive rate, non-bird detections, and thus is recommended to limit stoppages on wind farms.

Taking into account the increasing social expectations and regulations of environmental offices, Bioseco devices is a good choice to solve problem of bird mortality on wind farms, already proven on-site by some global wind energy players.

Chris Paszek

PES wanted to know more. We caught up with Chris Paszek, Cofounder of Bioseco to discover more about bird protection on wind farm.

PES: Hi Chris, a warm welcome to PES Wind, it's good to talk with you. Would you like to begin by giving us an overview of the Bioseco bird protection system?

Chris Paszek: Thank you for having me! My main idea behind establishing Bioseco was the desire to run a business that would fit in with the sustainability and protection of nature.

In short, we developed an innovative solution based on most modern technologies to protect birds on windfarms. Thanks to this, turbines are able to produce energy continuously.

The solution gives benefits to several parties: first, our subject: birds. Thanks to our system, they are protected. There have been no reported collisions of birds with a turbine blade where this system installed.

The second part is, of course, our customers. They receive a system thanks to which turbine shutdowns are minimized and thus the energy production and their profits increase. It also brings is the bigger possibility of further investments in wind energy. It is worth mentioning that our system breaks even, on average, after two or three years, depending on bird activity and the imposed shutdowns.

The third beneficiary of the use of Bioseco devices is society. We all benefit from the fact that more green energy is produced and the birds are no longer endangered and our kids and grandkids will get a chance to admire them.

PES: Are your systems really as effective as you say?

CP: Well, so as not to boast let's let the facts speak for themselves. First of all, the most important point is: where we installed the system, the birds stopped dying. And that alone could be enough. But there is still a lot of added value.

The system was tested during the German state-funded NatForWINSENT program, with the participation of the independent Swiss Ornithological institute, Vogelwarte.

Apart from that the system was tested in a program financed from EU funds on farms belonging to PGE EO, one of the largest energy companies in Central Europe and the largest in Poland.

Added to this, some of our clients started with a pilot to carry out their tests. As a result of all these studies, we can conclude that the detection rate of birds, of the well-known species in the observation area, is above 80%, which is considered a sufficient level for efficient bird protection.

At the same time the false-positive error rate is well below 5%. Our system is resistant and reliable, services are performed mainly remotely. During in the pilot project in Poland the system worked continuously for 99.8% of the assumed operating time per year, the missing 0.2% was due to software upgrade work. In general, the availability of our devices exceeds 99%.

PES: Does Bioseco system offer any other solutions?

CP: Our system is a technologically advanced solution. Customers get more from our system than just bird rescue. The key issue is to restart the turbine after it has stopped whilst the birds flock through. Our system restarts the turbine automatically afterwards.

The system monitors the operation and if for some reason the turbine doesn't restart, within a few minutes the system can send information to the operator. We know that this certainty about the operation of turbines is crucial for our customers.

Bioseco systems installed in Spain during 2020

Additionally, the application provides access to statistical data to analyse bird flights: their directions or altitudes. Customers sometimes use the camera view to identify not only birds, but also other events around the turbine. For example, the operation of neighbouring turbines or icing on blades.

PES: Is the system suitable for installation on any turbines and locations?

CP: Our client numbers are growing, and there are more and more countries where we protect birds. At the moment we are ready to install the system on almost all onshore wind farms in the world. Of course, we must prepare ourselves logistically for locations outside of Europe.

As for the type of turbines, at the moment our system is installed on turbines produced by: Vestas, SiemensGamesa, Enercon, Acciona Windpower and Alstom, while this year we will install the system on GE. Nevertheless, we are also able to install systems on turbines from other manufacturers.

PES: Is research and development an integral part of your company?

CP: Absolutely! Sometimes I hear questions such as: is your system ready? Well, it's ready, up and running. But we're constantly working on improvements. We are developing and extending the detection range to exceed 500 meters from the turbine, implementing more and more artificial intelligence in our algorithms, adapting the equipment to the latest technology developments.

Besides it's in our interest as there are systems needed to protect the environment in other fields such as airports.

PES: Do you have any interesting projects that you can share with us?

CP: We have just signed a contract with DISA Group, a large energy company from the Canary Island where our systems will be sent to a famous tourist destination, Tenerife. It will be summer, hopefully the quick installation and will give us time to explore a part of this beautiful island.

If we look at the financial results, 2020 was a very good year for Bioseco. We achieved revenue growth several times higher than in 2019. Perhaps it could have been slightly better if not for the pandemic. So far, 2021 looks even more promising for Bioseco than 2020, the customer interest is huge, and the value of contracts signed in the first quarter exceeds the results of whole previous year.

PES: We were wondering what is your geographic scope and do you have any plans to expand to other areas? What are your plans for the coming years?

CP: We have requests from Europe, Africa and Asia. We are open to providing our solution to any customer who wants to protect birds. This is our mission. However, in the near future we will continue to focus on Europe and put more effort into South Africa and perhaps have a pilot in the USA.

In order to be able to develop in other markets, such as the Asia, South America we need to expand first, but if there are any local companies interested in working with us, we could accelerate this expansion.

We are considering going public, probably on the Warsaw Stock Exchange, to raise capital to speed up growth, continue R&D and at the same time allow people who share the same idea of sustainable development to join us and become Bioseco shareholders. My personal dream is that one day Bioseco will become a hub for gathering and developing all technological ideas to protect animals and more broadly: nature.

PES: What impact has the pandemic had on your business, and do you see it changing as you progress in 2021?

CP: Covid has had a moderate impact on our business. Traveling to the installation sites was the most problematic issue. However, we are a software and modern technology company, we can do a lot of work remotely. We have taken all the necessary measures to keep our team safe and we stay resistant to the virus so far.

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