

# Lidar lives



She may have started life in rural England, but today ZX Lidar's Unit #106 is tramping the complex terrain of Greece, as she helps to pioneer the country's clean energy transition. 'Eunice' may be named after a sea nymph, but she's really a star when it comes to understanding the wind.





standout choice for gathering wind resource data. Eunice is now a wind measurement veteran but is still providing a top-class service helping to optimise the latest wind developments alongside existing wind farms across the region.

### The only choice

The first stop on her travels was the headquarters of Eunice Energy Group in Athens. The first and only energy company in Greece to generate power exclusively from renewables, Eunice Energy Group is one of the region's premier renewable energy companies and holds a significant position on the international energy map. With many years of experience in the development of innovative and integrated solutions for the production and use of renewables, the group executes large-scale PV, storage and wind projects.

Eunice Energy Group also manufactures EV chargers and its own in-house wind turbine, the EW16 Thetis, as well as working in the emerging fields of smart energy management and e-mobility. Putting innovation at the heart of its business and facing increased demand for wind measurement campaigns within its project development pipeline, the Group looked to expand its capabilities.

Faced with the challenging Greek topography, Eunice Energy Group soon determined that its many hills and cliffs make much of the country virtually off limits for the installation of a typical met mast for a wind measurement campaign. In such a complex landscape even the most sophisticated software isn't capable of accurately interpolating met mast data to deliver the necessarily low-uncertainty needed.

At some wind farm locations, the hub height of one wind turbine could be at the same elevation as the foundation of its neighbouring machine, which might stand on an adjacent hill. Lidars, with their unique capabilities, are particularly well-suited to the Greek topography though.

Using a low-power eye-safe laser, lidars can record detailed wind speed and direction characteristics beyond 200 metres of vertical height. This is way beyond the blade tip height of even the tallest wind turbine today and far exceeds the capabilities of conventional mast-based anemometers.

Armed with this knowledge and considering it vital to record data at the specific locations desired, Eunice Energy Group looked at ZX Lidars technology. Lidars can be moved around a site easily and quickly and don't need any major ground works like the concrete pad that is often required for conventional met masts to be installed, for example.

Eunice and all her sister lidar machines are thus blessed with inherent flexibility, moving around a site as required and recording data

Starting life in the Malvern Hills of Western England, ZX Lidars unit #106 was always expected to be a traveller and it wasn't long before she had traded the rolling hills of the UK for the far more challenging landscape of Greece. Now named after one of the mythical Nereides - sea nymphs of Greek legend - 'Eunice' was soon on her way to Athens to

live with her new family, leading renewable energy developers the Eunice Energy Group.

Today, nearly 15 years later, she is still there travelling the Greek islands and helping to map the nation's wind resources as it pivots towards a clean energy future. Indeed, the capabilities of a wind lidar make it the





across the full swept area of a turbine rotor and beyond, even for the much larger wind turbines anticipated in future. Able to define wind characteristics well above the height of a conventional met mast, lidar capabilities fit well with the broad trends for ever bigger wind turbines.

Not only is lidar technology future proofed, they become increasingly cost-effective given that met masts must become far taller to eliminate uncertainty in wind shear for larger wind turbines. This dramatically increases the cost of a met mast, especially once it goes above the typical 30-60 metre height, and taller structures also require a larger concrete pad to stand on. Increased mast heights also necessitate a switch to more expensive lattice-type structures rather than the standard and lower-cost tubular-type masts.

It means the data that lidars deliver can help to determine the exact location of the largest wind turbines for optimum power generation across even the most difficult sites.

There are also time and resource savings

available from lidars when considering field deployments. Lidars need just two staff to install whereas conventional met masts might need six or more. In addition, there are significant health and safety advantages as lidars do not entail working at height.

With a robust and self-contained PV and battery power supply ideal for the Mediterranean climate, Eunice is easy to power at the remote off-grid locations typical of Greece and this represents another major benefit.

With better, safer and faster measurements, crucially Eunice also provides trusted, bankable, data. Accepted by both the wind industry and the financial sector, IEC-compatible measurements from lidar lie at the heart of Eunice's special talents. Indeed, so good is the data from lidar that a subsidiary company of Eunice Energy Group, EuniLab, can use the information to plan its wind farm installations, with all measurements meeting IEC standards.

Having considered a number of alternatives, including deploying more met

masts, the standout operational benefits of lidar in terms of meeting Eunice Energy Group's wind measurement requirements meant a machine-like Eunice was the only viable solution.

Eunice Energy Group concluded that while the initial outlay is greater for a lidar, the overall life time costs are significantly lower. The depth and duration of the technical support offered by ZX Lidars made another compelling part of the choice for lidar. With some 15 years of service already under her belt and still going strong, Eunice is proving this was the right decision.

#### Casting light on wind

Having established unimpeachable credentials, Eunice took her first trip to one of the most up-market districts of Athens. Her first deployment came in mid-2016 and was on the roof of the Eunice Energy Group HQ just a stone's throw from the residence of the Greek prime minister. Her initial installation meant she could also call the President of the Republic and the Greek Parliament her near neighbours.



However, this glamorous beginning soon changed with deployment in the field where she swapped the glitz of presidents and prime ministers for more earthy neighbours of sheep and goats. Indeed, with wind power a relatively unknown development her new family were initially concerned that her strange looks could prompt suspicion and even violence. Certainly, Eunice resembles a rather strange lunar lander or even a space probe more suited to the landscape of distant Mars than the hills and valleys of Greece.

Fearing that local people could have damaged this relatively expensive piece of equipment, Eunice Energy Group recruited local shepherds to guard her and ward off any unwanted attention. Eunice was supremely unconcerned though and if there were any disgruntled locals, they certainly never made an appearance.

Nonetheless, she didn't escape unscathed given that some wild goats found the cable connecting the lidar to her power supply

delicious, whereupon it became inoperable. Her custodians soon learned to cover the cables with protective plastic tubes to ward off any goatly attentions and these guards became a key adaptation to her new rural home.

Since those early days Eunice has grown to be a family favourite among the Eunice Energy Group with engineers, developers and customers all admiring her unique strengths and capabilities. Playing a key role in evaluating the bulk of Eunice Energy Group's existing wind power capacity, Eunice has been at the heart of the planning campaigns for countless new wind power projects across Greece. Working for both Eunice Energy Group and others she also conducts power performance audits of wind turbines and executes third-party measurement services under the Eunilab brand.

#### Life as lidar

A pioneering and outdoorsy individual, with more than 14 years of exemplary service Eunice remains in robust good health and is

nowhere near retirement. She continues to hold her own in front-line service with support from ZX Lidars and retains strong links with her birth family who are always ready to offer advice and technical guidance when needed no matter how far she roams.

She plans to continue working for as long as possible, continuing to explore the winds of Greece and operating as a loyal partner to Eunice Energy Group and their customers with the help of ZX Lidars, her friends, and family.

Better, faster, safer and often cheaper than conventional approaches for wind measurement campaigns, Eunice could be considered as a movable 200 metre met mast. Given she has already delivered well over a decade of service, Eunice clearly represents great value. Indeed, Eunice can be thought of as very similar to renewable energy systems themselves, initially more expensive but ultimately capable of delivering many tangible long-term benefits.

She also continues to play a key role in the spirit of innovation that is key to the success of Eunice Energy Group. She supports their smart energy management and distribution system known as S4S: Storage for Sustainability, Smart Grid, Solutions, Security, for instance. First implemented in the archipelago of the Dodecanese, the island of Tilos became the first energy autonomous island in Europe using S4S technology.

Eunice Energy Group shares a vision for everyone to have the opportunity to become an independent and autonomous energy 'NetProsumer'. Typically eco-conscious, NetProsumers strive for energy autonomy and independence through renewable energy and associated technological advances. Eunice Energy Group aims to achieve this goal through a smart energy management system but combining wind, PV and storage into a community-based energy trading platform requires precise information. For the substantial wind power element of this plan, it is Eunice that will supply this vital data.

By helping to Greece to develop and more efficiently use ever greater volumes of renewable energy, Eunice and the lidar technology she holds was and still is the perfect partner. She has been so successful that Eunice Energy Group intends to expand its lidar contingent and adopt some of her younger sisters to help build a future in which every Greek household and business has a renewable energy role. As an innovator, pioneer, and reliable partner, Eunice has already played a key role in leading the county's green transition. But as a traveller roaming the hills of ancient Greece, she knows that it's not always the final destination but the journey that counts and Eunice, a wind lidar, is a big part of the journey to clean energy for all.

 [www.zxlidars.com](http://www.zxlidars.com)

